Water Resources People and Issues

Interview With

Professor Arthur Maass

US Army Corps of Engineers

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Water Resources
People and Issues

INTERVIEW WITH PROFESSOR ARTHUR MAASS

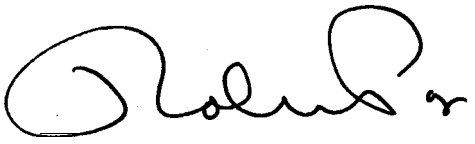
by
Martin Reuss

Office of History
United States Army Corps of Engineers
Fort Belvoir, Virginia
1989

Foreword

The history of water resources in the United States is long and complicated. The issues are complex and will no doubt remain that way, for problems dealing with water quality and quantity are not always easily resolvable. They involve overlapping jurisdictional, technological, and political questions. For more than forty years, Professor Maass has attempted to rationalize water management in such a way as to provide needed benefits in a cost effective manner. He has heavily influenced the Corps and other water agencies, both federal and nonfederal.

This interview and the accompanying articles provide an overview of Professor Maass's thoughts and insights into the evolution of his ideas. As we look toward the 21st century, it is important to keep in mind the steps that we have taken in the last half of this century to resolve our water problems. Professor Maass has been in the forefront of these efforts.



ROBERT W. PAGE
Assistant Secretary of the Army
(Civil Works)

The Interviewer

Dr. Martin Reuss is the senior civil works historian in the Office of History, Headquarters, U.S. Army Corps of Engineers, where he specializes in the history of flood control, navigation, and hydraulic engineering. He is the author of Shaping Environmental Awareness: The United States Army Corps of Engineers Environmental Advisory Board, 1970-1980 and has contributed articles to a number of journals, including Technology and Culture, The Public Historian, Louisiana History, Military Review, and Environment.

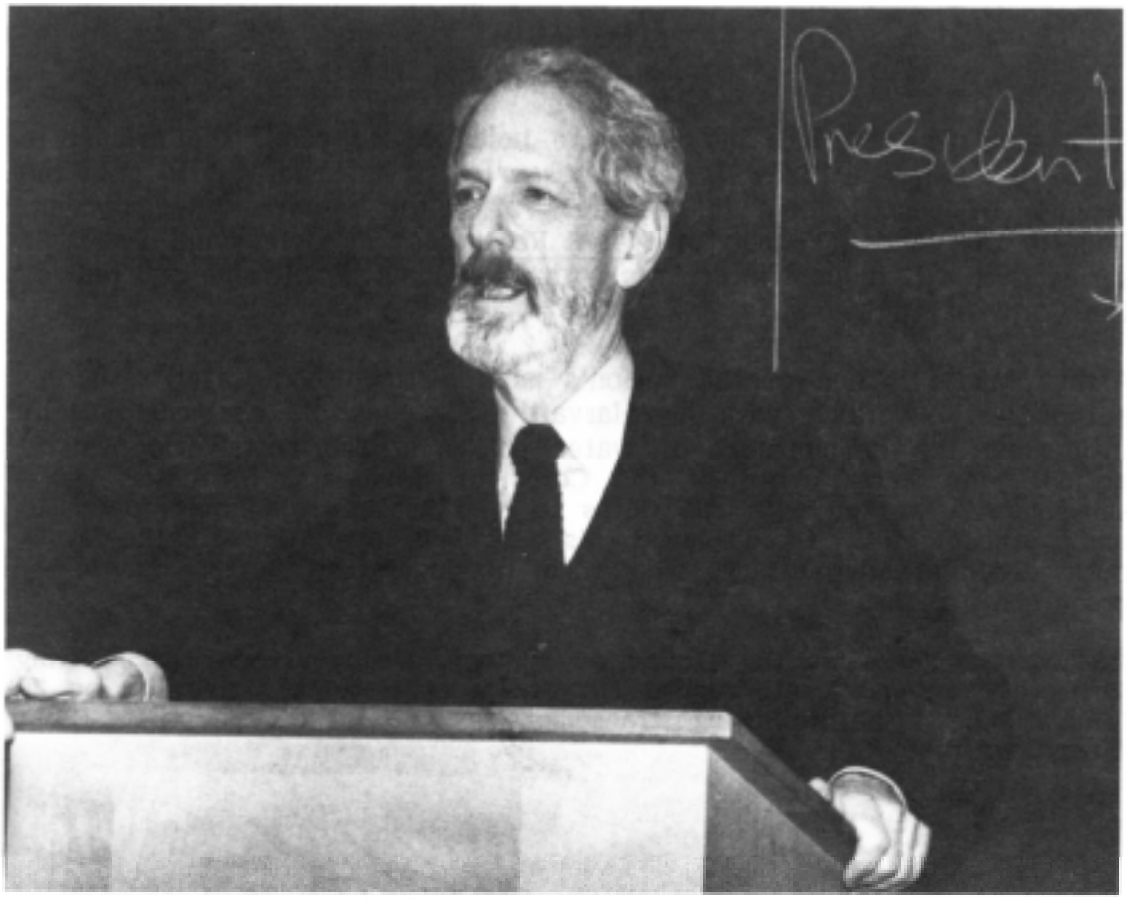
Preface

At a time when serious questions are being raised about the manner in which the nation utilizes its water resources, it is important to gain the insights of past leaders in the field of water resources development. This is the second volume of Water Resources People and Issues, a series that will include interviews with individuals both inside and outside the Corps of Engineers.

Arthur Maass is one of the nations most distinguished water resources authorities. Working with his Harvard colleagues, he has substantially influenced the development of water policy in the post-World War II period. An early critic of the Corps of Engineers, Professor Maass subsequently worked with the Corps to help improve planning procedures and methodologies. I recommend this interview to all those in the Corps, both civilian and military, who wish to understand better our water resources program.

Dr. Martin Reuss of the Office of History, Headquarters, U.S. Army Corps of Engineers, interviewed Dr. Maass at Harvard University on 20 May 1983. The following transcript is an edited version of that interview.

H. J. HATCH
Lieutenant General, U.S. Army
Commanding



Professor Maass

Biographical Sketch

Arthur Maass was born 24 July 1917 at Baltimore, Maryland, the son of Arthur Leopold Maass and Selma (Rosenheim) Maass. He remained in Baltimore through his undergraduate years, receiving his A.B. degree from Johns Hopkins University in 1939.

Upon graduation, Maass went to Washington as an intern for the National Institute of Public Affairs and served as an administrative assistant at the Bureau of the Budget, assigned to the Division of Administrative Management. He served in that capacity until mid-1940, when he received a fellowship to Harvard's Graduate School of Public Administration. The following year, he received his M.P.A. degree from that university.

After completing his work at Harvard, Maass returned to the government as a research technician for the National Resources Planning Board, a position he held until he entered the Navy in 1942. At the conclusion of his military service, in 1946, he spent a short time as a Navy Department budget analyst, then resumed his studies at Harvard.

Maass received his Ph.D. in political science in 1949. The previous year he had been appointed to the faculty of the Department of Government at Harvard University. In 1954, he was awarded full tenure. From 1954 to 1959, Dr. Maass was secretary of the Graduate School of Public Administration, and from 1955 to 1965, he served as director of the Harvard Water Program. During this time, he coauthored Design of Water Resource Systems: New Techniques for Relating Economic Objectives, Engineering Analysis, and Governmental Planning. This book promoted the use of computer simulations, mathematical modeling, and multiobjective economic analysis and planning to resolve complicated questions dealing with the design of water resource systems. In 1963, Professor Maass became chairman of the Department of Government, a post he held until 1967. Dr. Maass has received many honors during his distinguished career, including a Guggenheim Fellowship in 1955, the Clemens Herschel Prize of the Boston Society of Civil Engineers in 1958, a Fulbright Faculty Research Fellowship in Spain in 1960-1961, a Social Sciences Research Council Fellowship in 1961, and his appointment, in 1967, as Frank G. Thomson Professor of Government. He retired in 1984.

Perhaps Dr. Maass's greatest impact came with the 1951 publication of his book, Muddy Waters, aimed at the prevailing practices of the Army Corps of Engineers. His critique of Corps methods led to a reevaluation by the Corps of its policies and to the inclusion of Dr. Maass and other social scientists in the public works planning process.

Dr. Maass has been quite active beyond his Harvard duties. As early in his career as 1948 he was appointed to the First Hoover Commission as a

water resource analyst for the Natural Resources Task Force. He was director of the survey unit on conservation and development for Connecticut% Little Hoover Commission in 1949-1950 and served in an identical capacity, in 1950-1951, for Massachusetts* version of the same organization.

Throughout his academic career, Dr. Maass has been called upon to share his expertise in water resources development and administration. He has been a consultant for the Office of the Director of the Budget (1949), the Office of the Secretary of the Interior (1950-1952), the President's Materials Policy Commission (1951-1952), the Tennessee Valley Authority (1952), the Chief of Engineers, U.S. Army Corps Engineers (on a periodic basis, 1961 to present), the Bureau of Reclamation (1971), and the Ministry of Water Conservancy of the Peoples' Republic of China (1980 to present).

In addition to Muddy Waters and Design of Water Resource Systems, Dr. Maass has published other books and studies, among them Area and Power: A Theory of Local Government (1959), ... and the Desert Shall Rejoice: Conflict, Growth, and Justice in Arid Environments (with Raymond L. Anderson, 1978, (1986), and Congress and the Common Good (1983). Dr. Maass is also a regular contributor of scholarly articles on the subjects of water resources, public investments, and executive-legislative relations in the United States.

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INTERVIEW WITH PROFESSOR ARTHUR MAASS

Q: Professor Maass, by way of going back and just recapitulating some of the things that you have been involved with in your life--with water resources development--maybe we can start things off by talking about how you got involved in water resources, how you came to write Muddy Waters, and a little bit about your earlier career.

A: All right. I graduated from the college at Johns Hopkins University in 1939. I had been a student of V.O. Key and at his suggestion went to Washington for a year as a National Institute of Public Affairs intern. I was assigned to the Division of Administrative Management of the Bureau of the Budget, which only that year had been transferred from the Treasury Department to the newly created Executive Office of the President.

The Reorganization Act of 1939 gave President Roosevelt authority to propose reorganization plans to Congress, and the President asked his Cabinet officers to propose such plans to him. These would be reviewed by the Bureau of the Budget. I was put to work on the proposals of Secretary of Interior Ickes that the U.S. Forest Service be transferred to the Interior Department from the Department of Agriculture and that the civil functions of the Corps of Engineers be transferred to his department from the Department of the Army. That was my introduction to the activities and operations of the Army Corps of Engineers.

After the one-year internship in the Bureau of the Budget, I accepted a Harvard fellowship at the Graduate School of Public Administration, where I continued my interest in water resources while earning an M.P.A. degree. After one year at Harvard I returned to Washington to work for the National Resources Planning Board, which had been transferred to the Executive Office of the President at the same time as the Budget Bureau, and there I was able to further my interest in water resources programs. But that didn't last long, for soon after war was declared I joined the Navy, in which I served for a little over four years. Concluding naval service in 1946, I resumed studies at Harvard as a graduate student and took up again my interest in water resources, but more largely from an academic perspective.

My first book was called Muddy Waters: The Army Engineers and the Nation's Rivers. It was an administrative study of the civil functions of the Army Corps of Engineers. Although it was published by Harvard University Press in 1951, it was completed essentially as a Ph.D. thesis two years earlier. And some of its findings were published earlier, in an article in Harper's magazine of August 1949, "The Lobby That Can't Be Licked: Congress and the Army Engineers." This was written jointly with Robert De Roos, who was then a Neiman Fellow at Harvard, and its style is considerably more "popular" than I have used subsequently.

Also, before the book was published, but based on its analysis and findings, I was appointed to the research staff of the Natural Resources

Task Force of the first Hoover Commission, which was chaired by ex-Governor Miller of Wyoming. There I helped to write the sections of the task force report which deal with water resources, including a lengthy case study of conflict between the Corps, the Bureau of Reclamation, President Roosevelt, and the Congress over the Central Valley of California. The task force report was published in January of 1949, almost two years before the book.

The principal criticisms of the Corps of Engineers contained in Muddy Waters, to a certain extent in the task force report of the first Hoover Commission, and in a brassier form in the Harper's article, were really two. First, that the Army Corps of Engineers was not a responsible administrative agency because its leaders did not consider themselves to be directly under the supervision of the President of the United States. They called themselves "engineer consultants to the Congress of the United States," and their principal accountability, as they saw it, was to the congressional committees that had responsibility for authorizing studies and the construction of water resources projects. I criticized this unusual pattern of executive-legislative relations, involving, as it did, relations between an executive agency and a congressional committee that were so intimate that the President and the Executive Office of the President were virtually excluded from decision making and had little authority over the Corps.

My second principal criticism of the Corps was that it was overly conservative in the professional standards that were used to plan and design water resource systems. The Corps was oriented very much toward single-purpose projects, either for flood control or for navigation, and had failed to endorse enthusiastically the concept of multipurpose development exemplified in the exciting work of the TVA [Tennessee Valley Authority].

Based on this analysis and other considerations, the Hoover Commission task force recommended that the civil functions of the Army Corps of Engineers be transferred to the Department of the Interior and consolidated with those of the Bureau of Reclamation. There is a lengthy justification in the report for this recommendation, which I need not repeat here.

The Chief of Engineers at that time was General Pick. He took strong, very strong, exception to what I had said, as well as to other criticisms of the Corps that had begun to surface at the same time. His objections were stated most emphatically in testimony before a Special Subcommittee to Study Civil Works of the House Committee on Public Works, chaired by Congressman Robert Jones of Alabama. This sub-committee was established in response to the Hoover report and recent criticism of the Corps, and it provided the Corps an opportunity to respond. For this purpose the Corps prepared for the committee a lengthy report (subsequently published as Volume 3 of Part 1 of the 1951 Annual Report of the Chief of Engineers) which, most notably in Appendix B, responded to the criticisms of my book.

In the committee% hearings in April 1952, General Pick made some rather strong accusations against me for publishing this book. I won't repeat

them here, for they are available in the published hearings of the subcommittee. But I thought when I heard them (I was in the hearing room at the time), and have continued to believe, that the charges were entirely unjustified. In a letter to Congressman Jones, I subsequently made two points concerning General Pick's testimony.

First, the general said that he was positive that influential people who were interested in changing federal policy or attempting to usurp power themselves had been instrumental in getting books like mine written. I found the charge that I had been influenced to write a book for the purpose of supporting the objectives of an outside power-seeking group, rather than for the purpose, as I saw it, of discovering truth through impartial analysis of available data, to be a most serious charge. Furthermore, I believed that my profession had high professional standards and ethics, not unlike the general's view of his own profession.

It is true, of course, that my conclusions were approved and even publicized by outside groups, some of whom had objectives with which I agreed. But this would have been equally true, if, after a careful examination of the evidence, I had come to the opposite conclusion, that the Corps had over the years and in all cases developed the nation's water resources in accord with the most desirable standards.

Q° Did anybody ever accuse you of being a Communist as a result of your book, or of having "pinko" tendencies? Do you recall anything about that?

A: The general stated in his testimony that I was a member of a small and effective group who had been able to gain access to the archives of this great government of ours, to select and use to their advantage the information which can be found in the writings and sayings of governmental leaders that is not generally available to all of the people of the United States. Of course, this was absurd; my access was to public documents available to anyone. So there was an element of conspiracy theory in that comment, but I don't recall that General Pick ever accused me of being a Communist.

To repeat, the reason that the Jones subcommittee held these hearings was that the conclusions I had published in Muddy Waters and similar conclusions in other reports and articles had come to be repeated many times, and both the Corps and the committee felt that it was important to give the agency an opportunity to defend itself against these criticisms.

Soon thereafter, President Truman undertook to draft reforms in the resources area, based on the Hoover Commission reports. While teaching at Harvard, I was called in as a consultant to the Office of the Secretary of Interior to work on proposals for reorganization in the water resources field. I worked then with Joel Wolfson, Al Wolf, Maynard Hufschmidt, and ultimately Oscar Chapman, who was then Secretary of the Interior.

We developed a plan that would transfer the civil functions of the Army

Corps of Engineers to the Interior Department, to be merged with those in the Bureau of Reclamation. This plan was sent to the White House, and, to my secondhand knowledge (I have no firsthand knowledge of this), they had been approved tentatively by President Truman, when there occurred a great flood on the Mississippi and Missouri rivers.

In response to that natural disaster, President Truman flew over the flooded area with General Pick. As a result of this flight and subsequent meetings and activities, the President backed away from the proposed reorganization plan. It was never presented in Congress. It was aborted.

After General Pick retired, the Corps of Engineers rapidly changed its attitude concerning its responsibilities to the President and to Congress. The Corps decided that it was in fact a part of the executive branch of government. It began to cooperate with the Executive Office of the President and to report to the President directly and to the Congress only through the President rather than, as previously, reporting directly to the Congress.

When the Corps of Engineers changed its attitude, so did the congressional committees. They no longer expected the Corps to be the engineer consultants to and contractors for the Congress of the United States, which had been the justification for direct relations, but to report to Congress through the President. With these important developments, the case for reorganization became much, much less pressing in my view than it had been before. I lost interest in reorganization--although I did come to be marginally involved in two subsequent efforts, in 1966 and 1970--and began to believe that there were alternative and more effective ways to solve the problems that remained, as I saw it, in the government's programs for water resources.

My interest then changed from these organizational questions to the question of how to design multipurpose, multiobjective water resource systems. That change was signaled by the formation of what came to be known as the Harvard Water Program. This was a multidisciplinary research and training program, with faculty representing hydrology and engineering, principally Professor Gordon Fair, the elder statesman of the group; Professor Harold A. Thomas, Jr.; and their student, Professor Myron B. Fiering. Representing economics there were Professor Robert Dorfman and Professor Stephen A. Marglin, then a young student. Dr. Maynard Hufschmidt, who was then working in the program staff of the Interior Department and had previously worked in the National Resources Planning Board and the Budget Bureau on water resource problems, came to Harvard to be research director of this program. I was the faculty chairman.

In planning this multidisciplinary study of water resources, we explicitly eschewed any concern for government organization and reorganization which had consumed so much intellectual effort in previous years. We were going to study how to design complex water resource systems in the light of new techniques of analysis that were only coming to be applied to economic production functions and that involved simulation with high-speed computers, linear programming, and optimizing mathematical models.

The first results of this study were published in 1962 in a large book called Design of Water Resource Systems: New Techniques for Relating Economic Objectives, Engineering Analysis and Governmental Planning. This book, I think I can say (since I was only one of several authors), had a tremendous impact in the fields of public investment economics, engineering design, and hydrology. As I see it, there were three principal contributions from this first stage of the Harvard Water Program.

First was the use of simulation by computer to design water resource systems. We were, so far as I know, the first group to use simulation on high-speed digital computers to examine the economic as well as the physical consequences of alternative designs of such systems. Prior to this time there had been one or two simulation studies conducted entirely in physical terms, where the purpose was to find, for example, the best alternative design in terms of the number of kilowatt-hours that could be produced from a series of dams in a river basin.

Ours was much more complex than this, for our simulations included benefit, cost, and economic loss functions for multiple purposes of development (for example, electric power, irrigation, flood control) and multiple objectives of development (for example, national income, income redistribution). This contribution was reported initially in Design of Water Resource Systems and was further elaborated in a subsequent volume authored by Maynard Hufschmidt and Mike Fiering, Simulation Techniques for Design of Water Resource Systems.

A second major contribution was the development of synthetic or operational hydrology as a means for designing water resource systems. The point was this: Having developed methods to design systems with the aid of high-speed digital computers, we could use more hydrologic data than frequently were to be found in the historical record. The method then used by hydrologists in the Corps and elsewhere to construct a record longer than the historical record was simply to repeat the historical record or otherwise to manipulate it marginally.

Our hydrologists were convinced that the likelihood that an historical record will repeat itself is very low. One can take the basic data which constitute the historical record, mix them up in ways known to those who, like Thomas and Fiering, are familiar with the most sophisticated statistical techniques, and produce a synthetic record of streamflow that is more likely to represent the future than any repetition of the historical record. Having done this, you have a self-generator of hydrologic data that will produce as many years or hundreds of years of data as may be needed to compare alternative designs. This contribution, too, was reported in Design of Water Resource Systems, and it was developed further in a subsequent book by Fiering, Streamflow Syntheses.

The third contribution-which may be the. most important--was the development of multiobjective economic analysis and planning, which, it should be noted, is not the same as multipurpose planning. Multiobjective planning focuses on such objectives as economic growth, regional income distribution, and environmental quality, whereas multipurpose planning

relates to such purposes as flood control, navigation, and irrigation. Until then the design of water resource systems had been in terms of a single objective, namely maximizing economic growth. Other objectives, if they were taken into account at all, were never included in the basic analysis. They were discussed, usually nonquantitatively, in additional paragraphs in committee reports, that is, paragraphs added to those containing the principal analysis which was in terms of the single objective of economic growth.

We were convinced that this was wrong and that we now had available the techniques that would enable us to construct multiobjective planning functions and to design complex systems in terms of such functions. We did not pretend to prescribe the relative value that should be placed on each objective in a multiobjective function. But we believed that such values could be elicited in a political decision process involving the executive and Congress. What we did demonstrate was that you could design a complex water resource system in terms of a complex objective function.

This contribution was also presented initially in Design of Water Resource Systems. It was subsequently elaborated in a book by Professor Marglin, Public Investment Criteria; in two articles that I wrote, one in the Quarterly Journal of Economics and one in Public Policy; and in a monograph by Dr. David Major entitled Multiple-Objective Water Resource Planning.

It is interesting to note that the Corps of Engineers cooperated with the Harvard Water Program from the beginning and, indeed, became the leader among federal agencies in trying to develop and apply the new techniques.

Thus, the criticism of my first book, Muddy Waters, that the Corps had been backward in professional standards, that it was not as interested in multipurpose planning, which was then the new technique, as were other agencies--this criticism had by now come to be outdated. The Corps' enthusiastic cooperation in the development of new methods of planning proved this to me.

And there is other evidence of this. At about that time, I believe, the Corps organized its own research institute to carry on some of these studies, the Institute for Water Resources. One of the institute's senior officers was Colonel Charles Eshelman, who had been associated with the Harvard Water Program.

Also, I should have mentioned that in the years 1956-1958 the Corps assigned several of its senior civilian employees to the Harvard Water Program, as did certain other agencies, to help us in working out these techniques. Ed Landenberger was one, and there were a number of others.

With respect to the specific design techniques developed by the Harvard Water Program, the chief hydrologist of the Corps, Leo Beard, was not initially prepared to accept synthetic hydrology. He said we couldn't prove that a streamflow record like the synthetic one had occurred or

ever would occur. Indeed, it hadn't, for we mixed up the historical record and produced from it a synthetic one. Most of the hydrological community initially shared Beard's concerns about this new technique.

But soon, with some proselytizing by Thomas and Fiering, the technique came to be accepted. The Corps adopted it as quickly as any agency, I believe.

Next, with regard to multiobjective planning, the Corps climbed on board very quickly in the sense of making a major effort to see if this technique could be used in project planning. At that time the Corps was developing a special report on water resources in Appalachia, and for it they used mulitobjective planning.

Furthermore, the Corps was the lead agency in a large interagency framework study of water resource development in the entire North Atlantic region from Richmond to Maine. It was called the North Atlantic Framework Study. In that study there was a herculean effort--largely successful, in my view--to apply multiobjective planning. As a member of the advisory committee for the framework study, I helped to push the concept, and one of the best of the next generation of young scholars to come out of the Harvard Water Program, Dr. David Major, went to work on the study, directing the staff effort to apply multiobjective analysis. Major subsequently worked for the Corps in the Institute for Water Resources.

Furthermore, Steven Dola, who had been at Harvard during the years when we first developed these techniques, took a job in the Office of the Chief of Engineers, and subsequently in the Office of the Assistant Secretary of the Army for Civil Works, principally to apply these methods to Corps planning.

Finally, in the late 1960s and early 1970s the Water Resources Council developed a set of proposed standards and criteria that were to be used by all agencies in the design of water resource systems. These were fashioned around the technique of multiobjective planning, and the Corps of Engineers was, I would say, the lead agency in helping to define the new standards and criteria.

By this point, to repeat, my principal criticisms of the Corps in Muddy Waters had been well responded to. The Corps had become a leader in developing professional standards, and the Corps had also become as cooperative as any federal agency with the Executive Office of the President in clearing its projects and helping to develop a presidential program for water resources.

At this point, as I saw it, the main obstruction to the adoption of forward-looking, state-of-the-art techniques for the development of water resources was not the Corps of Engineers but the Office of Management and Budget. They strongly resisted multiobjective planning and frustrated the efforts of the special task force established by the Water Resources Council to rewrite the standards and criteria. OMB feared that if multi-objective planning were used it might result in greater demands for federal funds for water resource development, and that this was to be

avoided at all costs, even if multiobjective planning was more responsible than planning for the single objective of increasing gross national product. I supported this conclusion in an article on public investment planning which appeared in the journal Public Policy in 1970.

I realize now that I have failed to mention an important consideration relating to cooperation between the Corps and the Harvard Water Program. After the program concluded its first phase in **1962,** the **Corps** of Engineers entered into a contract with the Harvard Water Program to study application of the new planning techniques that were presented in Design of Water Resource Systems--the application of these to the water resource planning process of the Corps of Engineers. Maynard Hufschmidt led the study, and I like to think that, to a certain extent, the resulting report influenced the Corps' planning process.

Now let me change the focus a bit to say a few words about my consulting for the Corps subsequent to my participation in the Harvard Water Program. First, the Office of the Chief of Engineers established in 1965 or thereabouts a civil works study board under the direction, as I recall, of Alfred B. Fitt, who was a special assistant to the Secretary of the Army for civil functions. I consulted that study board on its recommendations, and my contribution can be found in the board's report.

In 1968 I consulted with the Office of the Chief of Engineers on a study of alternative institutional arrangements for managing river basin operations. I worked fairly closely with Colonel Robert Werner, who was in the Office of the Chief of Engineers. The recommendations that I made, which can be found in the reports of this study, concerned principally organization for river basin development.

In this same line of consultations with the Office of the Chief of Engineers, I was appointed a consultant to a task force on civil works planning, established in **1970** or **1971** and chaired by Brigadier General Robert Mathe. Here again, I think that anyone who is interested can see what contribution I made to this study by reading the task force report.

In April of 1970, Atlantic Monthly featured an article by Elizabeth Drew, entitled "Dam Outrage: The Story of the Army Engineers? I was outraged by this piece and undertook, after consultation with the editor of the Atlantic, to write a response. For this purpose, and in response to my request, the Office of the Chief of Engineers sent me considerable data. With those data in hand, I wrote the reply. The Atlantic, for their own reasons, refused to print it, whereupon Representative Ed Edmundson of Oklahoma entered it in the Congressional Record for December 22, 1970. I felt that Mrs. Drew was going back to criticisms of the Corps that might have been applicable in 1945 but were scarcely relevant in 1970. My reasons are spelled out in detail in that issue of the Congressional Record.

Let me conclude this imperfect summary of my relation to the **Corps** of Engineers in recent years by referring to the book published in 1971 by Arthur Morgan entitled Dams and Other Disasters. In that book Morgan accuses me of changing my views about the Corps of Engineers because the Corps had employed me as a consultant and contributed to the

Harvard Water Program. Obviously, I believed that this was entirely unfair. Morgan also attacked Dr. Gilbert White in this book in ways that seemed to me to be equally unjustified.

Morgan had previously written me, as early as 1965, for my views about the Corps, and I had responded to him at great length, telling him why my views had changed since publication of Muddy Waters and precisely on which points they had changed and on which they had not. Several years later Morgan sent a research assistant to interview me on the same subject. I tried to talk to this young man rationally but apparently without success. My impression is that Morgan's mind was fairly well closed; he was not prepared to entertain data or views in conflict with those he had learned many years before.

At that time, I received a letter from Lieutenant General Clarke, Chief of Engineers, expressing his concern about Morgan's unkind comments about White and me. I recall responding to General Clarke something to this effect: that Morgan had always had two sides, one creative, the other destructive. As Francis Biddle, who was chief counsel of the congressional committee that investigated FDR's firing of Morgan from the TVA, had said of him, "Morgan has the strength and the smaller weaknesses of the American zealot."

Like Gilbert White, I had tried in correspondence and by talking to one of his research assistants to encourage Morgan to look afresh at the Corps today, but he appeared only to have resented these efforts and searched instead for conspiratorial explanations for them, such as the suggestion that I had been bought off by the Corps consulting fees. The Congressional Joint Investigating Committee of 1939, to which I have referred, was "forced to conclude that there were differences of opinion on the TVA board which became exaggerated out of all proportions because of the Chairman's [Morgan's] propensity for attributing moral delinquencies to anyone who opposes him." The old boy hadn't changed.

As for reasons for changing my view of the Corps, I have indicated these earlier in this interview. I also summarized them in a lengthy footnote (number 7) to the 1970 article on public investment planning in Public Policy. Anyone who would like further explanation of why my views changed can see that article.

Q: Professor Maass, I've got some specific questions about your particular work, and then some more general questions about water resource development, and I'd like to have your comments on them.

First of all, turning to your own work, in particular Muddy Waters, I'd like to go back for a moment and capture the mind set in which you wrote that book. A few things occur to me. You asked, evidently, Harold Ickes to write the foreword to the book. The foreword is, to say the least, rather strident in condemning the Corps of Engineers. Your book, of course, is scholarly. Did you ever regret having Ickes write that foreword?

A: I guess the answer is no, but I probably would not do it today. Because of Ickes' foreword the book got public attention, but this

probably is not a good justification. Ickes's foreword was typical of his mind set and style. He was a very colorful man, and he frequently overstated his case. I thought everyone would take it as such and would not expect a foreword by Ickes to be as dull and as balanced as a scholarly study might be.

Q' Did you ever figure out whether you were quoted more or Ickes was being quoted more from the foreword in various reviews?

A' Yes, that depended on the medium. The daily press gave greater notice to Ickes, but the scholarly journals paid little attention to his views.

It is interesting, though, that when Ickes first wrote his introduction he included several long paragraphs on his objections to the Chicago Drainage Canal, which I had not mentioned in my book and which had little relation to the book. This had been a concern of Ickes when he lived in Chicago. The problem for me was how to get those paragraphs out of the foreword. It wasn' t easy for me--indeed, for anyone--to make such a suggestion to Harold Ickes So I had to work through people whom I knew a little better; namely Mike Strauss, the Commissioner of Reclamation, and Joel Wolfson, the Assistant Secretary of Interior. They agreed to suggest to Ickes that he cut the material on the Chicago Drainage Canal. He raised a terrible fuss but agreed finally to strike the paragraphs and allow me to "publish his dog with its amputated tail. He was a colorful character.

Q' You made in your book several major criticisms of the Corps: lack of responsiveness to the executive branch, conservatism in professional standards, and also the refusal to endorse multipurpose river development. Now I would like to talk about the last two, mainly. This conservative approach in professional standards--when you wrote the book, did you ask whether there was a good reason for the Corps to be conservative in its professional standards, considering its flood control responsibilities and the consequences if a dam collapsed?

A' One could argue that I wasn't sufficiently sympathetic to the conservative orientation of engineers, which results in part from the fact that they can be held to account for their errors. A social scientist will commit errors of interpretation in an article and then simply admit to them in a subsequent article. If, on the other hand, an engineer makes a mistake and his structure collapses, It's much more difficult for him to explain it away. And I probably was not as sympathetic to that source of conservatism as I should have been.

But I don't believe that in fact I criticized the Corps very much for its conservatism in design of structures, such as would be observed in overbuilding. There was a little criticism of this, but not much. My criticism that the Corps was overly conservative related to the fact that they failed to take into account planning purposes other than protection against floods and improvement of channels for navigation. They were unsympathetic to multipurpose planning as it had been developed by the TVA and was being used by the Bureau of Reclamation.

Q: This conservative engineering approach, of course, is part and parcel of this perhaps lack of sympathy with the multipurpose approach. You can look into transactions of the American Society for Civil Engineering in the 1930s and 1940s and come across engineering articles by people throughout the Corps who claim that you cannot, for instance, run a viable flood control program and also have a multipurpose project because the flood control reservoir has to be empty, your reservoir for navigation has to be full, and so forth.

A: Yes.

Q: Again, in light of those kinds of engineering concerns, do you feel that perhaps there was some justification for the Corps being conservative in refusing to accept with open hands the multipurpose concept?

A: Certainly they were justified in demanding that the advocates of multipurpose development come up with proof that storage space could in fact be used for more than one purpose. But I also think that the Corps was insufficiently receptive to suggestions about how that could be done.

You will recall that the Water Resources Committee of the National Resources Planning Board (the secretary of that committee was Gilbert White, and the chairman was Abel Wolman, a very fine civil engineer) concluded in several reports that much more could be done on joint use of reservoir space and conjunctive use of physical facilities than the Corps was willing to admit.

I must say that, at the time, I was much impressed by those reports in this regard, and I think that if the Engineers in the Corps today were to read again those reports of the late 1930s and 1940s, they might be surprised that their predecessors had opposed them so vigorously.

Q: Do you think some of the Corps' reluctance to embrace multipurpose river development had something to do with this upstream-downstream controversy that was taking place at the time, in other words, the tug of war between the Soil Conservation Service and the Corps?

A: Certainly that was part of the story. Those who proposed that we could solve the flood problem by upstream measures principally or exclusively exaggerated tremendously the possibilities of their program, and the Corps was right in pointing out the deficiencies of their analysis and claims. But then, as a reaction, the Corps became a little too vociferous in their opposition to upstream watershed programs.

In 1954 I wrote a lengthy article entitled "Protecting Nature? Reservoir" (published in Public Policy), in which I analyzed the upstream-downstream question.

The controversy between dams and watersheds originated, you will recall, with the Flood Control Act of 1936, which provided that investigations and improvements of rivers for flood control were to be under the Corps, while those for retarding water flow on upstream watersheds should be

under the Department of Agriculture. Between 1936 and 1954 the Corps and USDA [U.S. Department of Agriculture] were unable to agree on how to allocate the benefits of these two programs, that is, on the relative contribution to the prevention of flood damages that should properly be attributed to dams and to watershed programs. Some who called themselves conservationists at the time exacerbated the disagreements, making it more difficult for the agencies. For example, there was Elmer Peterson's book, Big Dam Foolishness, with a fiery introduction by Paul Sears.

The SCS's [Soil Conservation Service] involvement in the planning and installation of upstream structure and farm conservation practices for flood control was greatly accelerated nonetheless in 1954 with passage of the Small Watershed Act.

Q: In making a recommendation that the Corps' civil works function be transferred to the Department of the Interior, was the recommendation made mainly because you thought it to be just good government policy to put water resources development in one agency, or was it made because you felt that the Department of the Interior simply was more competent in dealing with water resources?

A: I think it was a little bit of both. One should keep in mind that reorganization transferring bureaus around from one department to another, was a trendy idea at that time. The broad justification for such reorganization had been developed by the Brownlow committee in 1937, and the Reorganization Act, which authorized the President to propose plans to transfer and consolidate bureaus, was passed in 1939.

Certain agencies were exempted from the President's authority, among them the Corps of Engineers. But that didn't mean that the President could not submit a legislative proposal to transfer the Corps of Engineers to the Interior Department and combine it with the Bureau of Reclamation. Secretary Ickes recommended such a reorganization to the President, and it was studied by the Budget Bureau. But before Roosevelt took any action, World War II intervened. It was not until after the war that attention was again focused on possible reorganization of the government for water resources development. This, then, was the environment for deliberations of the first Hoover Commission.

At the time, my convictions were based on two factors: one, that the Corps of Engineers was operating independently of the President and of the executive branch.

A: second and closely related factor was the backwardness of the Corps, at least as some of us saw it, in some of its professional standards, most importantly its failure to endorse the TVA concept of basin-wide planning and multiple-purpose planning. As I document in Muddy Waters, the Corps had fought pretty strenuously right down the line the National Resources Planning Board's recommendations for a new approach to river basin planning.

If one agreed--as I did--with the Planning Board in promoting integrated, multiple-purpose development of water resources, involving more than

simply flood control and navigation, which were the principal purposes of the Corps' planning at that time, then one way to force such broader water resource planning was to place the Corps under the President's authority.

Q: Of course, the Corps did get involved in basin-wide planning with the Pick-Sloan plan in the Missouri River, and by the late 1940s you have basin-wide studies of the Columbia being done.

A: The Corps was directed from outside to cooperate in those studies. I don't know that they necessarily wanted to do them. I think President Roosevelt ordered the Corps under General Pick and the bureau under Sloan to get together and come up with a single Pick-Sloan plan. There had previously been a Pick plan and a Sloan plan if I recall correctly.

Q: True.

A: The same was true in the Columbia basin. The Corps didn't go into cooperative planning very willingly. A lot of effort was lost in the frictions that were present among federal agencies.

Q: You mentioned before that in the mid-1950s the Corps started to change from an agency that thought of itself as mainly responsible to Congress to an agency that thought of itself as a responsible executive agency.

The question is, do you feel that this was done consciously by the Corps, or was this done basically to the Corps by other agencies, in particular by the Bureau of the Budget, which at that time in the Eisenhower administration was looking for cost cuts wherever it could. The Corps was basically in a very defensive posture, versus the Bureau of the Budget.

A: The latter certainly was one point, but I honestly think that there was a conscious effort by the Corps. I don't know about this for sure, but I have always had the feeling that some members of the Corps were just a little embarrassed by General Pick's last years in office, when he took so strong a position against proposals for change, and it was my impression that the next Chief of Engineers after Pick-1 can't remember his name.

Q: After Pick, it was Sturgis.

A: Sturgis, yes. I had the impression from talking to General Sturgis that he consciously wanted to get the Corps on a different track.

At the same time, the noteworthy changes between 1948 and 1968 in the attitude and policy of the Corps of Engineers was due to several factors apart from the personalities of the Corps' leaders. The Corps decided in the middle 1950s to cooperate with, rather than to oppose, constructive critics in the academic community. That was when they became a principal cooperator in the Harvard Water Program here.

Also, there was increasingly effective control by the Bureau of the

Budget over the legislative programs of all executive agencies, which is the factor that you mentioned. And the Corps began to feel a need for broader support in the executive, due, in addition to the factors above, to the relative decrease in significance of water resource development in the sum of federal programs and to the degrading of the Corps' representation at the Cabinet level.

With the merger of the Department of the Army into the Department of Defense, the Corps' nominal civilian and political representative, the Secretary of the Army, lost Cabinet status, and the Secretary of Defense had little time for, or interest in, the Army's civil functions. At the same time, the Secretary of the Interior had become more than ever the President's spokesman on water resources.

These, then, were the factors that accounted for the changes between 1948 and 1968 in the Corps view. I have discussed them in that 1970 article in Public Policy, especially in a lengthy footnote.

Since then, of course, we have had the rise of the environmental movement and all things related to it.

Q In the late 1950s and early 1960s you do have the articulation of something called floodplain management. I use that phrase because you can argue that floodplain management goes back before that time, but certainly the term becomes commonplace in the 1950s and early 1960s with Gilbert White.

The question is to what extent do you believe the Corps embraced floodplain management at the beginning? I mean, do you have any feeling about how receptive the Corps was to Gilbert White's ideas, the ideas that came out of the University of Chicago?

A Certainly they weren't receptive initially. If I recall correctly, Gilbert White's first book, Human Adjustment to Floods, which was his Ph.D. thesis in geography at the University of Chicago, was published in the early 1940s. Is that correct?

Q As a thesis, it was the early 1940s. I think it came out as a paperback in the mid-1950s.

A Perhaps so, but Chicago in those days published its Ph.D. theses, and White's came out in the 1940s. At that time, certainly, the Corps was not very receptive to his ideas concerning floodplain management. But Gilbert White is, as you know, a persistent man. He kept at it, and finally the Corps adopted the concept. I don't remember what year that was; it was when they supported a provision in the civil works bill authorizing floodplain studies.

Q In 1960, there was a floodplain management services thing--

A Yes. And once they accepted the concept, I had the impression that the Corps rather quickly began to make analyses of projects in the light of alternative adjustments to flood hazards. To be sure, they continued in many cases to favor flood control structures more so than

some of their critics. One of the first of the surveys in which the Corps actually rejected structures, recommending instead zoning and other flood management devices, was the Charles River study, which came along a bit later. But, on the whole, I have little criticism of the Corps once they became involved in floodplain studies.

Q. You were talking about the synthetic hydrology and the simulation that is now being used in place of modeling and so forth. A few questions. I don't pretend to be an engineer, and I don't know if I understand completely how simulations work; I'm sure I don't, actually. But the bottom line, the kinds of data you're looking for--isn't that still basically a very subjective type of operation, to decide which categories of data are the important categories?

A. Yes, indeed, it is. The principal advantage of simulation is that once you've written the simulation program, you can very quickly--well, let me start over. Simulating river systems for the purpose of design (I'm not talking about. operations) is not new. Corps planners have always simulated, but with desk calculators.

They would select two or three possible designs and then simulate with desk calculators the consequences of each of these in terms of river flows and of benefits and costs, by assuming that the design structures are in place and then running through them the monthly or daily streamflows that are taken from the historical record. Now with computer simulation one can, with the same amount of effort, test more than 100 alternative designs and find the best one of these. If you are able, with the same effort, to examine 100 alternatives rather than 2 or 3, and to recommend the best one, the chances are very high that the net benefits of the former will be much, much greater than those of the latter.

In either case one needs the intelligence of the engineer and the designer as to what data are relevant and what data are mostly irrelevant. And you don't want to design a computer program with a capacity that exceeds the firm and relevant basic data that you have in hand.

Q. Would it be fair to say that these kinds of simulations allow you to do more social engineering? What I mean by that, more or less, is using public works projects to redistribute the income.

A. Yes, you can vary your objective function much more easily; I believe that's what you are suggesting. Furthermore, with computer simulation you can test several alternative objective functions. You could have as a single objective to optimize national income, that is, to optimize the difference between benefits and costs, all measured in terms of national accounts. Or you could optimize national income subject to the constraint that you redistribute so much of this income to particular groups or to particular regions.

The point is that it's easy to specify a complex objective function in computer simulations, whereas this is much more difficult if the simulations are being done with desk calculators. And it is also easier to

compare the results of using alternative objective functions. But conceptually, there's no difference.

Q But then, of course, if you do get involved in these kinds of variables, you immediately get involved with political questions.

A There's no question about that. My point would be that we don't design and build dams for engineering reasons. We design them to meet national needs, and the national needs are the objective function.

Until our work in the Harvard Water Program, the objective function of water resource development projects was almost always to maximize the increase in gross national product. Yet, as I have pointed out in several articles, this most frequently is not the reason why government becomes involved in such activities. The government is likely to have different objectives: for example, to redistribute income among individuals or groups, to redistribute income from one region of the country to another, or to promote environmental quality.

Thus, to design programs that maximize the single objective of increasing gross national product is not at all responsive to national needs. This procedure may have been more acceptable when we didn't know how to do otherwise; but now that we have the capacity, with the use of simulation and other techniques, to construct complex objective functions and then to test which among many alternative designs will maximize such functions, there is little justification for continuing to design for national income only.

Q Are you familiar with how the Corps develops BC [benefit-cost] ratios now?

A I am not familiar with developments in the last four or five years. I do know, however, that the Corps' efforts to respond to requirements of multiple-objective design have been thwarted time and again by the OMB, which has discouraged and tried to prevent the Corps from using these techniques. But maybe you could be more specific about your question.

Q I was just going to lead into the obvious question: Do you believe that the Corps in the way that it develops its BC ratios today reflects this kind of multiobjective?

A Yes. I think it does better on this than any other federal agency. and the Corps would do much better than it does if it were not under the what seems to me to be unreasonable pressure from the OMB not to include in their planning any objectives other than increasing gross national product. OMB has said that in reviewing the Corps' projects and deciding whether or not to approve them in the name of the President, they will not allow the calculation of benefits and costs from multiple objectives, only those from increasing national income. At least they said that some years ago, and I don't think the situation has changed.

So the response of OMB to the Corps' efforts on multiple-objective

planning has been a great discouragement for the agency. What the Corps did, at least in the 1970s, was to prepare their multiple-objective analyses none the less, but to prepare also a single-purpose national income analysis, knowing that the OMB would use the latter one when it decided whether to approve the project or not. And this created great difficulties.

Q: That's true. There has been no water resources act since 1976. This kind of multiobjective simulation--does it have anything in common with risk analysis?

A: It certainly does. And we examined in the Harvard Water Program the problems of multiple-objective planning under different assumptions of risks and uncertainty. This turns out to be quite complicated and difficult, but It's important that uncertainty be considered in this context.

The problems of uncertainty and risk analysis relate also to the question of the discount or interest rate that is used for planning government projects. Some attention was given to this question, also, in the reports of the Harvard Water Program, especially the work of Stephen Marglin. In addition to what he has to say in Design of Water Resource Systems, Marglin subsequently wrote two articles in the Quarterly Journal of Economics on how to derive and use a social rate of time discount. as he called it, in designing water resources and other public projects. rather than the market discount rate, which he showed to be less relevant.

Q: Thank you very much for your time, Professor Maass.

Appendix A

"CONGRESS AND WATER RESOURCES"

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CONGRESS AND WATER RESOURCES*

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Should Twitch Cove, Maryland, be improved at Federal expense for the protection of the few crabbers who live near this Eastern Shore community? This past May, Congress decided yes; they confirmed a recommendation of the Chief of Engineers, U. S. Army. The United States Engineer Department, as the Corps of Engineers is called in the exercise of civil functions, recommended in favor of Twitch Cove after evaluating alternative plans of improvement and selecting that one which appeared to balance best the factors of "economic feasibility"- --i.e., the ratio of benefits to costs, "engineering feasibility," and the "desires of local interests."

This last item is of interest for the moment. For any major improvement, even for Twitch Cove, there will be many groups of "local interests," and their

*** Documentation for parts of this paper is to be found in the author's *Water Resources Devvelopment* (unpublished manuscript, 1949, Harvard University). This work will be published by the Harvard University Press in the near future. Sources are consequently cited in notes only where important documentation is not to** be **found in the manuscript.**

"desires" will differ, may even conflict. Thus, the Engineers seek to adjust these interests and to come up with a recommendation that will maximize the total desires of the community.

Congress for a great number of years has followed a procedure of legislative self-restraint with respect to water resources developments. It will not authorize any improvement which has not received a favorable report from the Chief of Engineers. And since the Engineers attempt to maximize local desires, it may be said that Congress has transferred important responsibility for the adjustment of group interests from its own body to the U. S. Engineer Department, an executive agency.

The Engineers have recognized the nature of the responsibility which Congress has delegated to them. They have conducted their organization. and operations in a manner designed to allow a rather full articulation of local group interests. The project planning procedure, from the time Congress authorizes the Corps to undertake an examination of a given area, involves twenty distinct stages at which group interests are able to present their views to the Corps. At three of these twenty, public hearings are regularly provided for; at two additional stages, Engineer Department instructions require consultation with local interests; and at the remaining fifteen, the extent of consultation varies with particular circumstances;' but the necessity of a constant awareness of the current attitudes of local interests is emphasized in all Engineer Department publications.

Recently, the Chief of Engineers said:

The authorization of a river and harbor or flood control project follows a definitely prescribed, democratic course of action. It is based upon the activation of the desires of local interests, who are most vitally interested. Local interests, as individuals or groups through the actions of their representatives in Congress, make request for an item to be included in a rivers and harbors or flood control bill (i.e., authorization to conduct an examination) .... The District Engineer, mindful of the need for developing all public opinion, holds an open public hearing at which not only those interests that are active in obtaining the authorization of the proposed work but also all other views are obtained and encouraged. Having thus developed the desires of the local citizens, the District Engineer makes a study ....

I. PRESENT ARRANGEMENTS AND TEE LEGISLATIVE PROCESS**

Several important consequences for the legislative process flow from this project planning procedure. These include the participation by members of

**** Arrangements relating to Congress, the Corps of Engineers, and the President are discussed. No effort is made to deal in any detail with the relations of Congress and the Bureau of Reclamation because of space limitations and the fact that Corps arrangements constitute the more controlling factors in legislation for water resources. This has become more the case in the last few years. Where the Bureau and the Corps have been in competition since 1936, the Secretary of Interior has sought support of the President's office to offset support which the Corps has gotten from Congress. But even with the President's support, the Secretary has not had great success in getting his programs adopted. As a result, the Bureau of Reclamation and its supporters in Congress, the Western irrigation bloc, have begun to use the same legislative techniques which have meant**

Congress in the "executive" planning process; legislation by committee resolution; service by the Corps of Engineers as consultants to, and contractors for, the Congress, certain congressional committees, and individual members of Congress; by-passing of the President and friction among executive agencies; and the interlocking of pressure groups, the Corps, and members of Congress.

Though Congress as a group has largelydisassociated itself from the process of project planning by transferring responsibility for adjustment of group interests to the Engineer Department, individual members of Congress have not been so abstentious. Representatives and Senators, knowing they cannot obtain congressional authorization for the projects they are sponsoring without a favorable report from the Engineers, have attempted to pressure them into approving these projects by appealing to District Engineers and to the Board of Engineers for Rivers and Harbors in Washington in public hearings.

The following quotations from members of Congress indicate the importance which the legislators attach to their appearances at Engineer Department hearings :

Rep. Dockweiler (Calif.). I have appeared before the Board of Army Engineers in behalf of a harbor in my district and I made what I thought was a pretty good case for improvement of Santa Monica Harbor .... And I think the conclusion of the Board of Army Engineers was that no work should be done there because there was not enough business there. ...

Of course we must abide by the decision of somebody, and the Army Engineers decided against me in that case.

Rep. Harris (Ark.). Mr. Speaker, the Army Engineers, of the Vicksburg district, who are doing a fine work in that area (tic), held a public meeting at Hot Springs, Ark., Friday, December 12, investigating the construction by the Federal Government of Blakely Mountain Dam and Reservoir, on the Ouachita River. I had accepted their invitation to appear before the engineers at that meeting, but, due to the emergency and declaration of war, I did not have the privilege. My remarks, however, were read for me and I insert them here in the Record.

Colonel Sturgis and gentlemen, on behalf of the people of the Seventh District of Arkansas, I am glad to appear before you in the interest of the construction of the Blakely Mountain Dam and Reservoir for flood control and power development. Needless to say the greater part of the Ouachita River in Arkansas runs through my district, affecting directly 8 of the 11 counties. ...

I wish to express my appreciation and the appreciation of the people throughout this whole area for the fine work the Army engineers are doing in the development of these projects for flood control and power facilities as well. The people are intensely interested and not only asking but pleading for this protection and development. ...

If the Engineers submit an unfavorable or partially favorable report, the proponents of a project seek a reexamination, for the Congress will, as noted, not authorize an improvement without a favorable Corps recommendation. At the same time, the Corps by law may not initiate a survey unless Congress hasspe-

such "success" for the Engineers. Adoption of these techniques has been limited, however, by the fact that support of the reclamation program of the Bureau is restricted in Congress to the Western bloc; whereas support of the navigation and flood control programs of the Corps is found in representatives from all areas.

cifically authorized it, usually in an omnibus rivers and harbors or flood control bill. However, to make it easier for members of Congress to require the Engineers to reexamine unfavorable reports in the hope that "changed conditions" may justify a favorable recommendation, the Congress has devised a truly unique procedure amounting to legislation by committee resolution.

After a report of the Chief of Engineers is one year old, any Representative or Senator may present a resolution to the appropriate congressional committee[1] which, if adopted by the committee, requires the "Board of Engineers for rivers and harbors ... to review the report with a view to determining whether any modification should be made at this time in the recommendation heretofore made." The committee resolution has the effect of law, and, it should be noted, is not subject to presidential veto.

Review resolutions have been quite common. As the Congressmen proposing the reviews enjoy no opposition to their requests in most cases,and as the Engineer Department has not been called upon often to report on the desirability of conducting reviews, the committees have been disposed to grant the requests, on occasion disregarding even the one-year waiting period. It is physically impossible for any one member of a committee to be informed on the history of all navigation and flood control projects. The Representative from Arkansas, for example, in all probability never heard of Mill Creek, Virginia, to say nothing of having any judgment as to whether or not the Engineers should be asked to review the report on this Creek; he will vote, Yes. Of 83 investigations completed by the Corps in fiscal year 1946, 20 were authorized by regular legislation and 63 were reexaminations submitted in response to committee resolutions.

The new House Committee on Public Works in 1947 resolved to cut down on this indiscriminate use of legislation by committee resolution. It adopted a rule extending the waiting period to three years and requiring the Chief of Engineers to report on the estimated costs of conducting the proposed reviews. The Senate Committee failed to follow suit.

It is difficult to evaluate the review resolution as a technique for pressuring the Corps to give its approval to the projects which the members of Congress desire. Available data, however, are rather impressive in showing the importance of the resolution in getting water projects approved, expanded in scope, or modified in terms of reducing the local contributions required.

The Congress, in its long history of legislating internal improvements, has developed close relations with the Corps. (The Corps was the engineering department of the Government which planned and executed the national internal improvement programs of the 1820's Congress considers the Corps to be *directly* responsible to it. By resolution Congress directs the Board of Engineers for Rivers and Harbors, an advisory board to the Chief of Engineers, to conduct reviews of surveys. It does not direct the chief executive officer,

1. In the House, Committees on Rivers and Harbors or on Flood Control prior to 80th Congress; now Committee on Public Works. In the Senate, Committee on Commerce prior to 80th Congress; now Committee on Public Works.

the President; nor does it even provide the President with an opportunity for veto.

The Corps concurs heartily in this relationship. The Engineers call themselves "the engineer consultants to, and contractors for, the Congress of the United States." The theoretical consequences of such a direct legislative-agency relationship are familiar to students of government and administration; they need not be repeated here.[2]

As might be expected, Congress as a whole is not equipped to exercise direct responsibility over the conduct of Engineer Corps civil functions. It is rather certain congressional committees--those with competence over navigation and flood control matters--that attempt to hold the Corps accountable. It is to them that the Engineers are directly responsible. Witness the review resolution procedure in which Congress in effect allows a committee to legislate for it.

Traditionally members of Congress from the Mississippi delta area, where flood protection, drainage, and river navigation problems assume great importance, seek positions on the committees which handle Corps legislation. Through regular re-election they attain positions of seniority. Will M. Whittington of Mississippi, chairman of the House Committee on Public Works, was for years prior to the establishment of this committee chairman of the Committee on Flood Control. Judge Whittington, a hard hitting committee chairman, has always had Corps legislation closely under his control. More than anyone in the executive or legislative establishments, he is in close contact with, and almost in a position of supervision over, the Chief of Engineers and the USED. Until his recent death, John Overton of Louisiana was number one man in the Senate on navigation and flood control legislation.

Direct relations between these committees of Congress and the Corps have developed into a close identity of interests between the two. The Committees on Public Works feel a proprietary interest in the Corps of Engineers and in the direct relations which prevail. In terms of policies for the development of resources, the important consequences of this will be stated later.

In some respects the Engineer Department is more nearly responsible to individual members of Congress directly than to Congress as a whole or to certain congressional committees. It is the member of Congress who initiates the legislative proposal for survey; he is first contacted by the District Engineer to determine the scope of the desired improvement and interested parties; he is first to be informed of any change in the status of the investigation. The nature of the authorization process--the enactment of omnibus rivers and harbors and flood control bills---is such as further to encourage direct responsibility to individual Congressmen. When hearings are held by congressional committees on favorably reported projects to be included in omnibus bills, the testimony of the member of Congress from the district in which the project is located is usually corroborated and supplemented by the Army Engineer present at the

2. A recent restatement of the major issues by Laurence I. Radway and this author can be found in "Gauging Administrative Responsibility," *Public Administration Review*, Vol. 9, pp. 182-193 (1949).

hearing. All of these techniques have led to a sense of direct responsibility on the part of the Engineer Department to the individual member of Congress.

Direct relations between Congress and the Corps mean, of course, that the Engineers by-pass the President. This is obviously bad, for the only place where related executive functions can be coordinated effectively is in the President's office. Prior to the 1930's there was no major problem as most river improvements were for single purposes and did not impinge directly on the activities of other agencies. In the early '30's, however, the Corps began planning multiple purpose projects throughout the country involving flood control, power, irrigation, drainage, and other uses, and coordination in order to produce the best multiple purpose plan for the development of major drainage basins seemed essential. The history of resources legislation and of the development of planning procedures between 1934 and this date constitutes very largely the history of efforts by Presidents Roosevelt and Truman to break down direct agency responsibility to the Congress and to substitute for it a pattern of responsibility to the Chief Executive. Only in these terms can recent developments in the resources field be interpreted.

The agency with which the Corps has had greatest friction due to lack of coordination is the Bureau of Reclamation in the Department of the Interior. In this inter-agency feud, which has been really intense since 1939, the Corps, for reasons already indicated, has enjoyed the strong support of the Congress. The Secretary of the Interior and the Bureau of Reclamation, on the other hand, have received less consistent congressional support and have sought to balance the advantage of the Corps of Engineers in this respect by obtaining the support of the President and his Executive Office. The general pattern may be expressed as follows : Corps of Engineers+Congress v. Secretary of the Interior + Executive Office of the President.

The fact that Congress as a body has transferred to the Engineers responsibility for adjusting group interests in proposing water developments, but that individual members of Congress continue to take an active part in the planning and adjusting process is revealed in an interesting manner by the national water pressure groups-particularly the National Rivers and Harbors Congress. This comprehensive lobby counts in its membership the "local interests" (state and local officials, local industrial and trade organizations, contractors), the U. S. Congress (Representatives and Senators are honorary members), and the Corps of Engineers (officers of the Corps engaged in rivers and harbors work are all ex-officio members). The members of Congress, though they are in a real sense the lobbied, take a very active part in the Rivers Congress. Today, for example, the President is Senator John McClellan of Arkansas, a member of the Public Works Committee and of the sub-committee of theCommittee on Appropriations which handles Engineer Corps funds, and chairman of the Committee on Expenditures in the Executive Departments-to which the Hoover Commission recommendations proposing reorganization of the Corps of Engineers have been referred. McClellan, as a member of the Hoover Commission, dissented from those recommendations which would divest the Army

of rivers and harbors functions. The national vice presidents of the pressure group are Senator Wherry of Nebraska, Republican floor leader and a member of the Appropriations sub-committee on Engineer Corps funds; Representative Whittington of Mississippi, identified earlier; and Representative Case of South Dakota, a member of the Committee or Appropriations and, at the time of his selection as vice president, of the subcommittee which considered appropriations for the Corps.

In the past the ex-officio members, officers of the Corps, also have taken part in the proceedings of the lobby, though today they are somewhat more circumspect. The Rivers Congress remains, however, the most active pressure group in support of the USED.

Perhaps the most interesting and important aspect of the Rivers and Harbors Congress is the work of the Projects Committee. When the National Congress was formed in 1901, its slogan was "a policy, not a project." The purpose was not to urge any specific waterway improvements but to interest the public and the Federal Congress in the development of waterways in general. In 1935, however, the Rivers and Harbors Congress reversed its policy, agreed to promote certain waterway improvements actively, and for that purpose organized a Projects Committee. The Committee meets once a year for several days preceding the annual convention to act upon all applications for endorsement. It holds hearings on each project, classifies it in one of several orders of priority, and presents its recommendations to the full Rivers and Harbors Congress for adoption.

Senators and Congressmen who are sponsoring waterway improvements in their districts appear before the Committee in order to obtain from that organization of which they are honorary members favorable recommendations for their projects. The following excerpts, in the April, 1940, issue of the ***National Rivers and Harbors News,*** are from a report of the annual meeting of the Projects Committee:

Congressman Joe Hendricks of Florida presented testimony on. the Cape Canaveral Harbor, which he stated will serve the $5,000,000 citrus fruit belt, which is now without proper harbor facilities.

Congressman John Jennings, Jr. of Tennessee, urged approval of the project for the construction of dams in the vicinity of Oakdale and Harriman, Tennessee.

Representative Edith Nourse Rogers, of Massachusetts, asked approval of the Merrimac River project. The project will help protect the city of Lowell, Massachusetts from disastrous floods, as well as the rest of that area, she said.

It is difficult to place a value on the general effectiveness of the Rivers and Harbors Congress because of the fact that it serves as a clearing house for uniting and coordinating the activities of local and sectional interests. The Congress itself puts forth bold claims as to its influence:

The influence of the National Rivers and Harbors Congress has been perhaps a more controlling force on legislation approved than that of any other organization .... Thus far there has been no adverse criticism of any of the recommendations made by the Congress in its resolutions and reports, and virtually every bill passed by the federal Congress for the improvement of harbors and waterways has been composed almost in toto of proj-

e&s previously investigated and recommended by the National Rivers and Harbors Congress.

The [Rivers and Harbors] Congress is the country's oldest and largest water organization and occupies *semi-official status* by reason of its close liaison with the governmental agencies, legislative and executive, responsible for public works. ...

Though the group may be correct in making these claims, we shall be content to accredit it with being certainly one of the most effective lobbies in Washington today.

II. THE NEGLECT OF WATER RESOURCE PLANNING

To this point we have considered consequences for the legislative process of the manner in which interests are adjusted in the planning of water projects More fundamental, however, are the effects of these consequences in terms of best development of the nation's natural resources. The planning process has produced two important results: an absence of national plans and policies for water resources and an absence of executive branch arrangements that might develop such plans and policies.

Water planning to date has been characterized by continued emphasis on the localized aspects of individual water projects. This emphasis begins with the requirement that all surveys be authorized by Congress. The members of Congress who propose survey items for inclusion in omnibus navigation and flood control bills usually do so in response to requests of local interests in their districts. These interests often have not the ability to visualize the relationship of the improvements they desire to multiple purpose basin-wide development.

This local emphasis is accentuated by the Corps of Engineers. It seeks to limit the scope of investigations to what was intended by the Congressmen responsible for the particular authorizations. Further, the survey procedure of the Engineer Department is so oriented that each individual water development project is considered almost exclusively in the light of benefits to be derived by the area immediately adjacent to the improvement. This is most often what the local interests desire. Thus, for example, if the benefits from dredging a harbor channel to permit entrance of deeper draft vessels into an east coast Florida port are measured in terms of additional traffic and business for the localized port area, the project will be easier to justify economically than if the benefits were measured in terms of the general effects of the new project on all east coast ports in the vicinity; some of these ports might lose traffic to the newly developed one.

Finally, the procedure for authorizing improvements, the omnibus rivers and harbors and flood control bills, emphasizes individual projects-the pork barrel. Representatives and Senators appear before the appropriate congressional committees, seeking committee approval for projects in their districts which have received favorable Engineer Corps reports. At hearings on the omnibus rivers and harbor bill of 1949, 54 Representatives and Senators from 24 states testified or submitted statements to Representative Whittington's committee; on the flood control bill of the same year, 62 Congressmen from 25 states appeared.

It is not meant to say that there has been no basin-wide planning on the part of Congress and the Corps. In recent years there has been some improvement in this respect, especially for western river basins. But here the broader view on the part of the Corps is inspired primarily by competition with the Bureau of Reclamation, which has traditionally used the multiple purpose basin-wide approach. Concerning waterways legislation, President Truman said to Congress in May, 1950;

Finally, I urge the Congress to develop more satisfactory procedures for considering and authorizing basin-wide development programs. We are a long way still, both in the executive and legislative branches, from the kind of comprehensive planning and action that is required if we are to conserve, develop and use our natural resources so that they will be increasingly useful as the years go by. We need to make sure that each legislative authorization, and each administrative action, takes us toward--and not away from this goal.[3]

Today we have no rational national water policy, even apart from the unrelated consideration of individual projects. President Truman recognized this in January, 1950, when he set up a temporary Water Resources Policy Commission under Morris L. Cooke to develop one.[4] Why is this true? Why are we spending hundreds of millions of dollars each year on water developments without a plan?

That ultimate responsibility rests with Congress, there can be no question. But Congress and congressional committees are not equipped to develop a national water plan out of whole cloth. They are admirably equipped to examine, approve, disapprove, and amend any intelligent programs presented to them which focus on the great issues. It is the Chief Executive who is best able to prepare such broad programs and assume responsibility for placing them before the elective body. For the greatest part of water development, however, the President has been short circuited. The Congress and the Engineers work together, but, as related, this combined labor has produced no plan.

The Corps of Engineers in reporting to Congress makes no special effort to point up the broad policy questions or to recommend or encourage the enactment of laws containing a careful definition of national policy in the water field. As the "Engineer consultants to and contractors for the Congress of the United States," they have, they say, no responsibility for initiating policies and broad programs; that is the function of Congress.

The following statement of Secretary of War Henry Stimson, in 1919, illustrates what we would put today into a broader framework:

When I was Secretary of War I found this situation, and I found that the reports of the Chief of Engineers which came to me were not "Is this an improvement which should be made in view of our particular funds this year--our particular budget this year--and in view of all the improvements in the United States taken at the same time?" but simply and solely "Is this an improvement of a waterway which should be made?" And the Chief of Engineers said he was directed by Congress to report in that way, and this was the way

[3] **Message to Congress in approving H.R. 5472, the rivers and harbors bill. Printed in *New York Times*, May 23, 1950.**

[4] **White House Press Release of January 3, 1950.**

he was going to interpret that, not in comparison with other projects, but simply whether in the millennium it would be a good thing for the country to have that waterway improved. When I said "That does not suit me at all. You come in here with a lot of propositions which you have approved, and you want me to approve, to improve the navigation of such and such a river and such and such a creek and such and such a harbor. I want to know how does that compare with the situation of the whole?" He said, "I have nothing to do with that. I cannot have anything to do with it. Congress will not listen to me on that. They reserve the judgment to do that themselves."

President Roosevelt tried hard to fulfill what he considered his duty-to develop a national water policy and to submit this to Congress for action. He created and supported the National Resources Planning Board and its Water Resources Committee. But in this position the President enjoyed the intense opposition of the Congress and of the Corps of Engineers. The Corps failed to give full and genuine cooperation to the Water Resources Committee in its efforts to develop a policy. It dissented from most policy reports of the Committee, most notably from the important 1941 Report on National Water Policy. The Congress was always unsympathetic to the NRPB; refused, despite frequent personal appeals from the President, to give the Board permanent statutory status; and finally abolished it by denying appropriations in 1943. The single most important reason for congressional opposition to the Board was probably resentment on the part of the so-called rivers and harbors bloc in Congress to any effort by the President to interfere with the direct relations between Congress and the Corps. Furthermore, Congress failed to pay any heed to the policy recommendations of the Water Resources Committee which, though they contained dissents from the Corps, were supported by the President.

Herein lies a lesson for the new Water Resources Policy Commission. The acceptance of its recommendations may turn on the support they can get from the Corps and the congressional Committees on Public Works. The members of the Commission seem well aware of this.

III. CONGRESS AND EXECUTIVE BRANCH ORGANIZATION

The fact that organization for water resources development is so inadequate today is in large part a result of the congressional attitudes we have outlined.

Theodore Roosevelt, Herbert Hoover, Franklin Roosevelt-all have tried to bring rationale into administration of water functions. And all have failed, failed because Congress will brook no interference whatsoever in its direct relations with the Corps. As one writer has said, "The civil functions of the Army Corps of Engineers constitute a veritable Rock of Gibraltar against all executive attempts to introduce any organizational integration of flood control and river development with the land use, irrigation, and electric-power activities of other federal agencies."

In recent years the Bureau of the Budget, as a coordinating agency for the President, has tried to break into the direct channel between the Corps and Congress. It has required that survey reports (in the same manner as proposed legislation) be submitted to the Executive Office of the President, prior to sub-

mission to Congress, so that the Corps can be informed of the relationship of the reports to the program of the President. But when the Executive Office informs the Corps that a project does not conform with the President's program, the Engineers pay no heed. They recommend to Congress, nonetheless, that the project be adopted.

The Budget Bureau is the source of statistics to back up this conclusion.[5] Between January, 1941, and September, 1948, the Corps of Engineers submitted to the Budget Bureau 436 reports favorable to construction of federal improvements. Three hundred and sixty were cleared with no objections to the authorization of the projects, and 76 were (a) held by the Bureau to be wholly or partially not in accord with the President's program (44 reports) or (b) were the subject of specific reservations stated in special comments by the Bureau (32 reports).

With regard to the 44 reports held not in accord with the President's program, the Corps of Engineers transmitted reports on all of these projects to Congress with favorable recommendations. Congress authorized 38. Of the total of 76 projects on which the Bureau made some reservations and comments, Congress authorized 62; seven were either abandoned, or considered by Congress and rejected, while seven projects had not yet been formally considered by Congress. The projects authorized by Congress upon which the Bureau had expressed reservations or full opposition had a total estimated cost in 1947 of $2 billion; those not authorized by Congress, a cost of about $500 million.

Senator Douglas' recent publicized effort to reduce by $840 million the authorizations contained in the 1950 rivers and harbors and flood control bill provides another illustration. Most all of the projects which Douglas attacked had been given low priority or held not in accord by the Bureau of the Budget. Yet the Senate, like the Senate and House Committees on Public Works and the House of Representatives before it, adopted the recommendations of the Chief of Engineers and disregarded those of the President.

Under the present planning pattern, the water experts of all agencies of the Federal government do not cooperate to prepare reports on the best uses of water in any drainage basin. Rather the Corps of Engineers (or the Bureau of Reclamation, as the case may be) undertakes a survey for which it assumes sole responsibility. It may or may not call in experts of other agencies during the conduct of the survey. When the report has been completed and tentative recommendations announced to the local interests, then the report is referred to other agencies for comment; but experience has proved that clearance occurs too late in the planning process for effective coordination.

This pattern of uncoordinated planning was set by Congress in enacting the first two national flood control bills in 1936 and 1938. Although it was known, certainly by 1938, that the President, the National Resources Planning Board, the Budget Bureau, and the Agriculture and Interior Departments all preferred

[5] Commission on Organization of the Executive Branch of the Government, *Task Force Report on Natural Resources* (Washington, 1949), Appendix 5.

provisions for genuinely cooperative planning, Congress preferred to assign the **planning** responsibility directly to the Corps, not to the executive branch as a whole through the person of the President.

The NRPB recommended that the President veto each of these bills for this failure, among other reasons. The President approved them, but in each instance stated his opposition to the uncoordinated planning provided and his determination to alter this within the executive branch. He said in 1938:

I have approved this bill with some reluctance. ...

It is not a step in the right direction in the setup provided for general government planning.

I am in doubt as to the value of some of the projects provided for and it is unwise to place recommendations to the Congress solely in the hands of the Engineer Corps of the Army in some cases and of the Department of Agriculture in other cases.

Coordination of all such public works involves a wider survey and the examination of more national problems than any one bureau or department is qualified for.

In these respects future legislation will be vitally important, in order to give to the Congress and to the country a complete picture which takes all factors into consideration.

For the coming year, however, I shall try to obtain this coordination by asking for complete consultation between all groups and government agencies affected. In this way the whole of the problem can be made more clear. I have, however, approved the bill because it accomplishes a number of good things, with, however, the reservation that its deficiencies should be corrected as early as possible.

The President was unsuccessful in this resolve, due largely to those congressional-Corps relations we have been discussing. The same obstacle prevents the President from consolidating important resources functions. Theodore Roose**velt** recommended to Congress in 1908 that responsibility for water development be centralized. Congress, expressing full confidence in the Corps of Engineers, failed to implement his recommendation. Herbert Hoover proposed to Congress in 1932 that the civil functions of the Corps of Engineers be transferred to the Department of Interior. His reorganization plan, submitted under the Economy Act of 1932, was roundly defeated in the House. The members of the House Committees on Flood Control and on Rivers and Harbors, Democrats and Republicans alike, opposed the reorganization. Franklin Roosevelt in 1937 proposed that Congress enact legislation permitting him to effect reorganizations within the executive branch. No agencies of Government were to be excluded. When in 1939 Congress finally- passed the Reorganization Bill authorizing the President to submit plans to Congress which would become law unless vetoed by both Houses of Congress within 60 days, the Corps of Engineers was one of a very few purely executive agencies placed beyond application of the legislation. Harry Truman in 1945 asked that Congress reenact reorganization legislation (it had lapsed some years previously) and that no agencies be exempted from its provisions. Congress did exempt some eight agencies, seven of them independent commissions or boards, and the eighth, the Corps of Engineers.

The Hoover Commission in 1949 proposed that the water resources functions of the Corps of Engineers and the Bureau of Reclamation be consolidated in a Water Development and Use Service and that this Service be organized within

the Department of Interior or, as three commissioners urged, within a new Department of Natural Resources. In proposing this consolidation, the Commission's task force on Natural Resources said:

Perhaps the most imposing argument against transferring the civil functions of the Corps of Engineers to another agency is found in the intense opposition with which any such proposal is likely to be met. There is no need to emphasize the powerful local and congressional support of the Corps .... The history of past reorganization efforts reveals the difficulties encountered when measures have been proposed involving my change whatsoever in the civil functions of the Army Engineers.

To implement this proposal and many others, President Harry Truman and former President Herbert Hoover urged Congress in 1949 to enact a general reorganization bill. The legislation was to be similar to earlier reorganization bills in that plans submitted by the President would become law unless vetoed by both Houses of Congress within 60 days. It was to differ from earlier legislation in that both Truman and Hoover insisted on a "clean bill," one containing no exemptions, and on a permanent bill, not one that expired within a few years.

The supporters of the Corps of Engineers, both in and out of Congress, objected strenuously to the proposed legislation. Herbert Hoover lashed out at these supporters and their demand for exemption for the Corps. Despite considerable opposition, the House passed the bill with no outright exemptions. The Senate, too, passed a "clean bill," no exemptions. But the Senate bill has a joker, one to which the House had to agree to get any bill at all. This joker provides that any reorganization plan submitted by the President shall become law unless vetoed by a constitutional majority of *one* House. This constitutes a major reverse for administrative reorganization; the bills of 1939 and 1945 had required veto by both Houses.

Why did the Senate insist on this change? Because the congressional supporters of the Corps of Engineers announced that they would forego outright **exemption for the Corps *only if* Congress would agree to a one-House veto.[6] They were sure that any proposed transfer of the Corps could not get through**

[6]The report of the Senate Committee on Expenditures contained the following:

"By far the largest number of witnesses appeared in behalf of the exemption of the civil functions of the Corps of Engineers, including representatives of valley improvement, flood control and development associations, chambers of commerce, and other State and civic organizations: 17 of the 25 witnesses appearing at the hearings, and **14** of the 23 resolutions and communications submitted for the record, were in support of such exemption. In addition, hundreds of telegrams and letters from **44** States and the District of Columbia were received by the committee, expressing opposition to granting any reorganization authority to the President which would permit the transfer of the civil functions of the Corps of Engineers to any other department or agency ....

"An amendment to exempt the civil functions of the Corps of Engineers, offered by the chairman [Senator McClellan], was defeated by a vote of 5 to 4. Several members of the committee indicated, however, that in voting against this exemption they reserved the right to favor such exemption should the Senate not approve the amendment providing for disapproval of reorganization plans by either the House of Representatives or the Senate." ***Senate Report*** 232, 81st Cong., 1st Sess., pp. 12-15, **17** (April 7, **1949).**

Congress under these conditions. And to make sure that future changes in the complexion of Congress might not alter this situation, they provided that the bill expire at the end of Truman's present term of office. The ease with which Congress, under this scheme, can defeat reorganization plans of the President has been demonstrated recently with grim reality.

Continued congressional opposition to Valley Authorities has been in part a consequence of the traditional legislative handling of water business. Congressional supporters of the Army Engineers, particularly members of the congressional committees to which the Engineers report, have been among the most violent opponents of Valley Authority legislation. They argue that the Engineers are doing a fine job and should not be displaced by independent corporate organizations.

It will be remembered that in 1937 President Roosevelt sent to Congress his famous message on regional authorities--the "8 little TVA's," as it came to be known. This much misunderstood proposal called for dividing the nation into eight regional areas for the purpose of developing integrated plans for resources development and management. At least in the early years, regional authorities with responsibilities broader than just planning would be set up or continued in only three areas. These were the TVA, the Columbia Valley Authority, and the Mississippi River Commission.

A careful reading of the hearings on this legislation before House and Senate committees reveals that almost all opponents of the bill, no matter whether their hostility to the legislation was inspired principally by opposition to hydroelectric power, by fear that the favored position of navigation interests in river development might be adversely affected, or by other causes, expressed complete confidence in the Engineer Department and an unwillingness to see any tampering with its duties in regard to rivers and harbors and flood control.

Significantly, the only Valley Authority legislation which has passed the Congress, that creating the TVA, was not handled by the committees which write navigation and flood control legislation, but rather in the Senate, by the Committee on Agriculture and Forestry, and in the House, by the Military Affairs Committee. These committees, particularly the Senate Committee on Agriculture, have been infinitely more sympathetic to Valley Authorities than the committees with which the Engineer Department has cooperated. Thus the fate of Valley Authority legislation, at least in so far as getting a sympathetic committee hearing is concerned, has depended in large part on the committee of reference.

The classic example is the legislation proposed by the President, and introduced by Senator Murray, to create a Missouri Valley Authority (S. 555, 79th cong., 1st Sess. [1945]). Senator Murray wished this bill referred to the Committee on Agriculture which had handled TVA legislation. The opponents of an MVA wished it referred to the Committee on Commerce, which then handled navigation and flood control. The Committee on Irrigation and Reclamation was also interested. Senator Murray lost, and this meant sudden death for the MVA. In an almost unprecedented action, the Senate adopted a resolu-

tion (Sen. Res. 97, 79th Cong. 1st Sess. [1945]) referring the bill to all three committees----*first*, for a period of 60 days to the Committee on Commerce with respect to navigation and flood control; second, for an equal period, to the Committee on Irrigation and Reclamation with respect to their competence; *last*, to the Committee on Agriculture. Within 60 days the Commerce Committee had reported back unfavorably; some five months later the Committee on Irrigation reported unfavorably. There was no necessity for the Agriculture Committee either to hold hearings or to make a report--the bill was dead.

Responsibility for TVA legislation was apparently shifted to the Committees on Public Works in the Congressional Reorganization of 1946. Thus, when President Truman's Columbia Valley Administration proposals were introduced, they were referred to these committees, the very ones which work 'most closely with the Corps. CVA legislation has received a most unsympathetic hearing on both sides of the Capitol. Indeed, with the exception of Senator Sparkman, an Alabama supporter of TVA, it is hard to find conscientious CVA proponents on either committee.

IV. THE PROPER ROLE OF CONGRESS

What function *should* Congress perform in water resources development and how ***should*** this function be organized? To answer these questions we should, perhaps, go back to the fundamental problem of legislative function. Here we shall develop two characteristic theoretical approaches to this problem. One seeks to determine the unique indispensable contribution the modern legislature can make to democracy. This approach defines function in the biological sense; it emphasizes the vital organic contribution of legislatures to modern government, rather than the relationship of the legislature to other branches of government activity. The other approach emphasizes just what the first would reject. It defines the legislative function largely in terms of the relations of legislatures to other organs of government.

Miss Elaine Tanner of Radcliffe College has completed recently an excellent survey of legislative theories.[7] Seeking a functional definition of the unique contributions of the legislature in the modern democratic state, Miss Tanner finds most current formulations inadequate, or rather in need of restatement. She suggests a two-fold function for the 20th century legislature. First, it can bring to modern government certain intangible qualities of the non-specialist, the insights and sensitivities of a non-technical collective mind. As its second contribution, the legislature occupies a critical place in a process that must welcome rational change. Capacity for change and for choice between alternatives is the institutionalized expression of individual freedom--of the "open mind." Capacity for change is the ultimate strength of democracy, the antithesis of totalitarian policy making. And it is the legislature which can "institutionalize the open mind." "It can make the Government see the obvious and do something about it, regardless of political, psychological, or other deterring

[7] **Elaine Tanner, *The Function of the Modern Legislature* (unpublished manuscript 1950, Radcliffe College)**.

conditions." By performing this function the legislature not only permits freedom but also government efficiency, for efficiency can be associated with ability to change, to choose alternatives, to see errors and correct them, to avoid bureaucratic narrowness and totalitarian closeness.

A second theoretical approach, developed with greatest insight in this country by Carl Friedrich,[8] emphasizes more directly the relation of the legislature to the bureaucracy. Bureaucracy is viewed as the very core of constitutional government in the sense that no modern government can long survive without an efficient administrative organization. Constitutionalism presupposes a functioning bureaucracy, for constitutionalism consists largely of efforts to subject the bureaucracy to popular influence and control. The legislature plays its distinctive role in the manner in which it holds the bureaucracy responsible and accountable. Parliamentary bodies "appear as integrating agencies through which the policy of the government and the claims of the various interested groups are expounded to the larger public with a view to discovering a suitable balance." Thus, in holding the bureaucracy responsible, legislative assemblies are not limited to legislation, investigation, and appropriation (in all of which, it must be remembered, they do not have exclusive jurisdiction); they participate also in popular education and propaganda.

On the basis of these two approaches, can we derive a proper water resource function for the Congress? From both the Tanner and Friedrich analyses we can conclude that Congress should be concerned with important national water policies. It is when dealing with major issues of policy, not with survey reports on individual projects, that the "unspecialized" and the "open" mind-and thus the Congress representing this mind collectively-can be most effective. If the Congress is to hold the bureaucracy accountable, then it must adopt certain standards or guides, and these standards are just what is involved in legislation setting national water policies rather than legislation concerned with projects only. Further, unless Congress focuses on the major policy issues, it cannot perform its educative function. The people of the United States cannot be interested in whether or not Mill Creek, Virginia, is improved, nor even in whether Arizona or California should be allotted the greater share of the waters of the Colorado River. But they can be aroused on national policy issues such as the prevention of speculation and monopoly in benefits derived from Federal improvements.

Both analyses indicate also the desirability of holding the executive branch of government clearly responsible for presenting to the Congress well-balanced legislative proposals which focus on major issues. In this way the legislature can debate, adopt, reject, or amend them. The "open mind," if it is going to effect change, must have something to change, must have a standard. And an important part of Friedrich's doctrine of bureaucracy and constitutionalism relates to the professional. obligations of the bureaucracy, involving in this

[8] See especially his *Constitutional Government and Democracy* (Boston, 1941). A new and revised edition of this excellent work is now in press.

ease a **clear** responsibility for submitting to the legislature competent policy proposals.

Having agreed that Congress should be concerned with important matters of policy, we must attempt to determine whether Congress should **limit itself** largely to this concern; whether, in other words, it should back out entirely from the area of authorizing individual projects----from the biennial omnibus rivers and harbors and flood control bills. Keeping in mind both the functions for which the legislature is best equipped and the acknowledged necessity for holding the bureaucracy in close check, an ideal solution for authorization would appear to be this. Congress should pass a basic law setting out in some detail the standards to be met by any proposed water project desirable of development. The executive water development agency should then be authorized to undertake any investigation, not having to rely on Congress to authorize each survey, and to approve for construction any project that meets the standards of the. basic law. For any project not falling clearly within the standards, but highly desirable in the eyes of the executive agency, a recommendation for special authorization should be submitted to the Congress. Congress would always have the authority to disapprove by legislation any project approved by the agency under this general authorization.

The basic law should further set forth criteria for establishing priorities among approved projects. The manner in which the agency applies its appropriations against project priorities, established in accordance with standards of the basic law, would, of course, be reviewed yearly by the Appropriations Committees. Finally, Congress should insist that the basic law be reconsidered periodically, and that the executive agency adopt a continuing program for reexamining, on the basis of experience, the operation of the law and recommending to Congress revisions of standards.

This proposal involves a more complete transfer of responsibility for adjustment of group interests than that in current practice. The proposal is made, however, in full view of both the undesirable consequences we have found to result from the existing situation and the conclusion reached earlier that an **important** function of the legislature is to integrate and coordinate the conflicting claims and interests of the government and various interest groups. With respect to the latter, it has never been said that adjustment is exclusively a legislative responsibility. To the contrary, adjustment of group interests occurs throughout the administrative and legislative processes. In this instance, the integration and coordination of group interest which is required in setting the basic statute will be a responsibility of the Congress; that required for developing individual projects, a responsibility of the executive agency.

This proposal for very broad delegation of responsibility for interest group adjustment should not aggravate the already bad consequences we have noted from a more limited delegation. On the contrary, it should bring improvements in the existing situation. The very fact that, within the limits of standards set in the basic act, full, rather than incomplete, responsibility would be transferred should remove much of the pressure on Congress. Thus, for example,

the technique of the review resolution would not be available. The executive agency would no longer look to Congress for the authorization of specific investigations. There would be no hearings on omnibus authorization bills at which interested members of Congress and the representative of the Chief of Engineers form a team in support of projects.

To be sure, individual members still would seek approval for investigations and projects in their districts. But they would be more on their own; they would not be supported in the same way by congressional committees. And the members of the committees themselves would not continue to occupy the same highly preferred positions they have now with respect to the conduct of the water agency.

This proposal is not new. The Reclamation Act provides similar machinery. But this machinery has run into difficulties in the last few years. The standards of the Act are not adequate; and the parallel existence of a vastly different process for authorizing Engineer Department projects has caused untold difficulties for Reclamation. If the Cooke Commission, as promised, comes up with an adequate set of standards, and if the process of approving multiple purpose water resource developments is made uniform (as it should be for all projects, no matter who constructs them), then the proposed method of authorization can be effective.

A number of other revisions in legislative organization and procedure might, of course, be mentioned. But space permits the mention of only one relating to committees. Jurisdiction over major water resources programs is split in both Houses of Congress between two committeesD--those having supervision over the Corps of Engineers and other public works and those concerned with the Bureau of Reclamation and other programs of the Department of the Interior. This is a major source of difficulty and unless remedied may well preclude any significant improvement in the conduct by Congress of its water business.

Finally, a great many of the difficulties in water legislation today are a consequence of, or in an important way related to, the division of water development responsibilities in the executive branch between the Corps of Engineers, the Department of Interior, and other agencies. From the point of view of Congress, therefore, significant improvements in the legislative handling of water resources may well be impossible without executive reorganization.

Appendix B

"PROTECTING NATURE'S RESERVOIR"

Article reprinted from Public Policy 5 (1954): 71-106.

PROTECTING NATURE'S RESERVOIR*

Arthur Maass

IN July of 1953 the 83rd Congress, though hellbent on economy, appropriated $5 million for a new and unbudgeted national program of "watershed protection." Neither President Truman nor President Eisenhower had requested this money in their Budgets; it was provided at the urgent request of certain Members of Congress who were concerned over a rising public pressure for national action on watershed flood control. Clifford Hope of Kansas, chairman of the House Agriculture Committee, presented the item to the Committee on Appropriations. "I am sure," he said, "that the members of this Subcommittee are aware of the tremendous interest in watershed programs which exists throughout the country today. As a matter of fact, I am convinced that the country is far ahead of the Department of Agriculture and the Congress on this subject "[1]

But in appropriating $5 million for this purpose Congress was not dealing for the first time with the watershed problem. In June of 1936 it had declared that "destructive floods upon the rivers of the United States ... constitute a menace to national welfare," and that "the Federal Government should improve or participate in the improvement of navigable waters and their tributaries, *including watersheds thereof,* for flood purposes if the benefits to whomsoever they may accrue are in excess of the costs, and if the lives and social security of the people are otherwise adversely affected."[2] To this end Congress provided that Federal investigations and improvements of rivers for flood control and allied purposes should be under the supervision of the Chief of Engineers, and that Federal investigations of watersheds and measures for runoff and water flow retardation and soil erosion on watersheds should be undertaken by the Department of Agriculture. The Secretary was authorized and directed to make watershed flood control surveys in the same localities in which the Corps of Engineers was authorized to make river surveys for flood control.

* See bibliographic note at conclusion of article for method of citing sources.

1 Ref. (C), p. 583.

2 Flood Control Act of 1936, 49 Stat. 1570. Emphasis added.

By June of 1953, however, the Government had made very little progress on the watershed program authorized in the Flood Control Act of 1936. The Department of Agriculture had not yet agreed upon a rationale for the program, nor upon an organization to develop such a rationale. During this seventeen year period the Department had recommended to Congress improvements on only 26 watersheds.[3] And with respect to these, there was little agreement in the Department, the Executive Office of the President, or the Congress that adequate or satisfactory plans had been proposed. Congress had authorized the 11 watershed proposals prepared before World War II (all in the Flood Control Act of 1944), but had failed to take any action on those submitted thereafter; and relatively little work progress had been made on the authorized watersheds. It is in the light of these facts that we recall Clifford Hope's conviction that "the country is far ahead of the Department of Agriculture and the Congress on this subject."

WHY SO LITTLE PROGRESS?

Why had so little progress been made since 1936? Why had the Department of Agriculture been unable to make effective use of the Flood Control Act? It is the purpose of this article to develop an answer to these questions and then to interpret Congressional action in 1953 in the light of this answer.

In brief, the answer is that the Department of Agriculture, considering its internal organization and its relations with outside groups, with the Budget Bureau, and with Congress, had been unable to adjust to a *project-by-project,* in contrast to a *nationally uniform* approach to an agricultural problem. The Flood Control Act contemplated a project approach, similar to that of the Corps of Engineers. But for Agriculture, that which was to be applied on a project basis, "measures for runoff and waterflow retardation and soil erosion prevention on watersheds," was not well delineated in the legislation nor in the work preparatory to it. Neither was the relation of a program of watershed projects to the nation-wide conservation programs of the Department.

[3] Eleven surveys were completed before World War II interrupted USDA work on this type of activity; and 15, thereafter. The general report on the Missouri River Basin Agricultural Program is not included in the count for this purpose.

PROTECTING NATURE'S RESERVOIR

How should flood control be provided on watersheds? By upstream engineering practices such as flood water retarding structures? By land treatment practices designed to improve the water retention and regulating capabilities of crop, pasture, and woodlands? Or by a combination of these two and yet other devices?

How should the desired practices be installed on farms and other private lands? By use of Federal technical assistance to farmers? Incentive payments? Supporting credit? Extension education? Or by a combination of several or all of these and others?

Since the Department's national conservation programs provide for land treatment measures by various combinations of the means listed above, how should the watershed project by-project approach be meshed with the national programs? Should the national programs be accelerated for selected areas? Or should the watershed projects be separately authorized and conducted?

It is in solving these difficult problems that the Department has had so little success. But responsibility for failure does not rest on the Department alone. As we shall see, the Budget Bureau, the committees of Congress, and the 1936 legislation inaugurating a watershed program must share, in varying degree, this responsibility. (Where the law is at fault, however, the USDA can be held accountable for failing to propose remedial legislation.)

THE FLOOD CONTROL ACT OF 1936: A PUBLIC WORKS APPROACH

Let us start, then, with the 1936 Act. As I have recounted elsewhere, this legislation was drawn up in 1935 by the Flood Control Committee of the House of Representatives as an "emergency measure," designed primarily to insure that flood control projects would receive a large allocation under the $4.8 billion emergency relief appropriation then under consideration by the Congress.[4] It was not considered a vehicle for determining important policy in resources development. When the bill emerged from the Senate Commerce Committee almost one year later, however, it had been expanded in scope

4 See this author's *Muddy Waters: The Army Engineers and the Nation's Rivers* (Harvard University Press, 1951), pp. 83-6.

to expound a national policy for flood protection. In deriving this policy the Commerce Committee had worked almost entirely with the Army Engineers; it had not consulted other interested agencies- the Departments of Agriculture and Interior and the National Resources Committee. These agencies disapproved the bill as reported; they considered it totally inadequate as a determinant of public policy in the broad field of water and related land resources. Among other deficiencies, the bill made no mention of watershed programs and surveys and granted no authority to the Department of Agriculture in this regard. Since it appeared certain, however, that the Senate, reacting to the disastrous spring floods in the eastern United States, would pass the flood control measure at the 1936 session of Congress, and that time was too short to work out a new and more generally satisfactory approach to the problem, the agencies agreed to press for amendment of the bill on the floor of the Senate to meet some of the most obvious deficiencies, including the failure to recognize flood abatement on watersheds. With the aid of President Roosevelt and the White House the bill was amended; and though the NRC considered the amendments inadequate and recommended a veto, the President signed the bill with some reluctance on 22 June 1936.

This legislative history is recounted to demonstrate the inadequate preparation of the 1936 Act. Not until the bill was reported from the Commerce Committee bv Senator Copeland, in late April of 1936, does the Administration appear to have been alerted to its important policy implications. Only at the last minute, in Senate debate on the bill, was legislative consideration given to the watershed aspect of river development. Then the Senate accepted, and the House immediately concurred in, several amendments prepared hastily by representatives of the Soil Conservation and Forest Services and Senator Hayden of Arizona who represented the President in the floor debate on the bill. It was hoped and expected by many that the 1936 Act would be replaced soon bv legislation based on more careful study. But this has not been the case. The procedure and organization for project planning set forth in this first national flood control law have come to be repeated in subsequent laws.

In connection with a project-by-project approach to the

development of navigation facilities the Corps of Engineers and Congress had evolved a detailed and unique system of executive-legislative relations.[5] In outline this system was as follows: Congress, in an omnibus Rivers and Harbors Act, authorizes the Corps to investigate the desirability of improving a given area; the Corps conducts a survey to determine the most suitable plan for improvement and whether such improvement is economically justifiable; the Corps submits its survey report to Congress and if the report recommends construction, Congress is likely to authorize the project in an omnibus Rivers and Harbors Act---*i.e.* authorize the Corps to proceed with construction in accordance with the survey plans when money is appropriated; if the survey report is unfavorable to improvement, the House or Senate Committee having jurisdiction over rivers and harbors may by Committee resolution direct the Corps to reexamine the area.

This public works project approach to resources development was adopted in the 1936 Flood Control Act for the activities of the Corps of Engineers. This was to be expected since the Corps took the initiative in working out the Act with the House and Senate legislative committees. The last minute amendments by which watershed programs were "counted in" the legislation applied the same unique system to the Department of Agriculture. Thus, the Department was faced with a new project-by-project program for agricultural lands, a new method for program analysis and justification, and a new pattern of executive-legislative relations---for all of which there was no important precedent in other basic programs of the Department. To this date the USDA has been unable to work effectively under the Corps' public works procedures.

CONSEQUENCES OF INCLUDING USDA UNDER CORPS PROCEDURES

At the outset it was believed by many in the Department of Agriculture and the National Resources Committee that the Department and the Corps would prepare joint survey reports on rivers and their watersheds with joint responsibility for the findings and recommendations. This, they said, was the intention of the framers of the watershed amendments and of the

[5] For a detailed statement of this procedure, see *Muddy Waters, op. cit.,* ch. 1.

Congress in accepting these amendments.[6] But joint reports never materialized. First, the Corps of Engineers was generally not inclined to participate in any cooperative investigation of navigation or flood problems. Second, the Department of Agriculture was not prepared to conduct the watershed aspects of preliminary examinations and surveys at the rate of speed desired by the Corps Thus, though the Department of Agriculture was authorized and directed to make watershed surveys at the same localities where the Corps was to make river surveys for flood control, the two survey programs have been conducted independently of one another from the beginning.

Left, then, to shift alone in this new environment of project reports, the Department of Agriculture faltered. The preparation of survey reports on the Corps model has involved many techniques not easily applied to watershed improvements. Take, for example, the benefit-cost ratio. The costs of a project are. compared to the monetary benefits to be derived, such, for example, as flood losses prevented. These are reduced to an annual basis and stated as a ratio. If the ratio of benefits to costs is greater than 1:1, the project is considered justified economically. The Department of Agriculture has had great difficulty deriving benefit-cost ratios for its watershed programs. As recently as December of 1952 a subcommittee of the House Committee on Public Works, which is accustomed to dealing with the economic evaluation methods used in Corps survey reports, had this to say of the report on the Brazos River Watershed, Texas, considered "typical" of the Department's watershed reports :

"In summary, the economic evaluation appears to use figures both in estimated costs and in estimated benefits that are not at all firm. ... While the stated figures show estimated benefits well in excess of estimated costs, the *calculations,* the *assumptions,* and their *presentation* do not inspire confidence. The real economic value of the program is left in doubt."[7]

[6] Memo **of Chmn. Water Resources Committee, National Resources Committee, 16 Dec. 1938, subject: planning of flood control investigations; in National Archives.**

[7] **83rd Congress, 2nd Session, House Committee on Public Works, Subcommittee** to Study **Civil Works, Report on Economic Evaluation of Federal Water Resource Development Projects, House Committee Print No. 24, p. 36. Emphasis added.**

similarly the Bureau of the Budget and the Chief of Engineers have expressed dissatisfaction with the USDA's "project economics." In connection with the Brazos Watershed Report, General Pick, Chief of Engineers, said: "I do not believe, however, that this method of investigation and planning is adequate to develop the engineering plans, estimates of cost, and data on economic justification, which we consider necessary as a basis for recommendation."[8]

The difficulty may lie in the efficiency with which the Department has conducted its surveys. More likely it is due to the fact that the Department of Agriculture has been trying to apply to an agricultural program a public works project analysis that is hardly applicable.[9]

The preparation of project reports has, in addition, involved the Department of Agriculture in a type of detailed Budget Bureau review and control that does not prevail for other Department programs. For a great many years the executive departments have been required to submit to the Budget Bureau legislative proposals and proposed testimonies on legislation, so that the Bureau can act for the President in coordinating proposals and informing the departments of the relation of their statements to the President's program. That the Corps of Engineers has not in the past cooperated willingly with. the President's office in setting national resources policies is now well documented.[10] For one thing there is little basic legislation on navigation and flood control. The omnibus Rivers and Harbors and Flood Control Acts are written in the House legislative committees and consist largely of Congressional approvals and authorizations of individual project survey reports; so that national policies, to the extent that they exist, must be sought in the reports themselves. For this reason largely the National Resources Planning Board and the Bureau of the Budget in 1940 drafted, and President Roosevelt signed,

[8] Brazos River Report, p. 4.

[9] The House subcommittee recognizes this in part.

As an added factor, certain groups in the Department, in the Forest Service in particular, feared that the procedure of economic evaluation in the Flood Control Act might become a precedent which the Congress or Budget Bureau would seek to apply to the Department's regular programs. This they did not want.

Other survey techniques of the Corps which have perplexed the Department are period of *amortization, cost allocation,* and *principles of local cooperation.*

[10] *See Muddy Waters, op. cit., passim.*

an Executive Order requiring all Federal construction agencies to submit to the Budget Bureau all investigation and survey reports before they are sent to Congress, so that Budget can determine the relation .of the reports to the program of the President. In this way it was hoped to bring the Corps under some degree of executive control.[11] As might be expected, the Budget's techniques for reviewing individual project reports have differed somewhat from those for reviewing general legislation. The Bureau has examined and criticized benefit-cost ratios, including the sufficiency and accuracy of the specific economic data supporting them; cost allocation principles; etc.

Unlike the Corps, the Department of Agriculture has cooperated well with the President's office on matters of agricultural policy. These are usually spelled out in legislative proposals for national agricultural programs. For its watershed flood control program, however, the Department must clear with Budget on a project-by-project basis, as a public works agency. And in this capacity the Department has experienced difficulties. Budget's criticism of USDA project economics has been noted. Other and more serious differences of opinion between Budget and the USDA over watershed project reports will be discussed below.[12]

Finally, the preparation of project surveys under the law of 1936 has required the Department to report, for this program alone, to legislative committees other than those on Agriculture. The Committees on Public Works, as we shall see, have an entirely different perspective on watershed programs than the Committees on Agriculture. It is with the Committees on Public Works and their predecessors that the Corps had built up such a unique system of executive-legislative relations, based on project reports.

A RATIONALE FOR A WATERSHED PROGRAM

Working with the procedural requirements of the Act of 1936, the USDA has sought without success to develop, and gain

[11] *Ibid.,* pp. **101-2, 126-9.**

[12] Also, as a part of project clearance and coordination, the Department of Agriculture, for the watershed program alone, must comply with other procedures required of the Corps of Engineers, such, for example, as referring each project report to the Governors of all affected States for review, and to the Federal Inter-Agency River Basin Committee. *Ibid.,* pp. **108-12, 124-9.**

general approval for, a rationale for watershed programs. In the late 1930's and up until the war Milton Eisenhower, as director of the Secretary's Office of Land Use, undertook to coordinate for this purpose the varied efforts of the Forest and Soil Conservation Services and the Bureau of Agricultural Economics. he achieved agreement on a number of important points, notably, the limited effects of land treatment measures on major floods at downstream urban centers, but he was unable to work out a broadly consistent Department rationale for watershed programs. As a result, when watershed survey work was resumed after the War, two views emerged, competing for acceptance within the Department. The one emphasized structural measures such as small retarding basins and bank protection works for the stabilization of small watercourses--a headwaters engineering approach. The other emphasized a broad variety of measures such as reseeding of pastures, deferred grazing, contour cultivation, fertilizing crop and pasture lands, terracing, intensifying farmer education, broadening farm credit, in addition to the watercourse structural measures--all for inducing proper use and treatment of the grass, crop, and forest lands-in the watershed. This was a comprehensive land use approach in which flood abatement was considered in the broad light of general agricultural development.

The difference between the engineering and the comprehensive approaches to watershed flood control has its counterpart in a dichotomy of views on the best method for planning land conservation for an individual farm; and a brief analysis of this dichotomy is instructive for our purposes. The technicians of the Soil Conservation Service, in making a farm conservation plan, concern themselves very largely with soil. practices. They recommend terracing, or contour farming, or strip cropping, so as to "treat every acre according to its capabilities and needs." On the other hand, certain agricultural economists argue that conservation for a farm should be planned in terms of the management of the whole farm business and the farm home too, rather than in terms of soil practices alone.[13] Alternative operating budgets should be worked out for each farm showing

[13] See Charles Hardin *The Politics of Agriculture* (Free Press, Glencoe, Ill., 1952), pp. 60-6; and the writings of John D. Black, Earl Heady and Sherman Johnson.

the expensesand income from different systems of land management and including in the alternatives only systems which promote proper land use. Thus, for example, on the basis of such an analysis the most effective way to get conservation on a New England dairy farm might be to make available $2,000 in low interest intermediate credit. With the credit the farmer could expand his barn to accommodate four more cows. To supply pasturage for the cows he would then convert certain fields, which are subject to erosion, from an annual cash crop to permanent pasture; and this would constitute good soil conservation. The point is that technicians using the SCS method of farm conservation planning would not have come up with a proposal to provide $2,000 credit for barn expansion. They likely would have proposed that the fields in crops be seeded to permanent pasture, but this proposal would not have been related to the total picture of farm operations. The SCS method is too narrow, too single purpose, argue the agricultural economists; and because it is so narrow it does not accomplish even its single purpose as well as would a more comprehensive method.

In the Department of Agriculture it is a group within the Soil Conservation Service who have supported the engineering approach to watershed programs, and technicians of the Bureau of Agricultural Economics and the Secretary's Office who have advanced the more comprehensive view. The economists on the Secretary's staff have considered a broadly conceived basin plan as a framework within which the farm planning approach could be applied to individual farms. Secretary Brannan was particularly anxious that the Department evolve broad river basin plans for agricultural development and flood control; to achieve this he sought to have the project reports prepared cooperatively by many agencies of the Department under direction of his own Office, rather than by the Soil Conservation and/or Forest Services alone.

The most ambitious and comprehensive of the reports developed under Brannan's leadership was that on the Missouri River Basin Agricultural Program, the first to be sent to Congress after World War II. This report was prepared by a field committee of representatives of nine agencies of the Department, under the leadership of the Secretary's Office. The land

grant colleges and universities, the Great Plains Agricultural Council, and other agricultural and forestry agencies of the States in the Missouri Basin participated. Secretary Brannan called this report an "innovation," "a new and outstanding landmark in planning," for its proposals would be "carried out under a *comprehensive, unified,* and *multiple purpose* plan especially designed to meet the unique needs of the Missouri Basin." The first purpose of the report is to "complement and protect" flood control, irrigation, power, navigation, and other projects that have been authorized for the Missouri Basin under the Flood Control Act of 1944 (the Pick-Sloan Plan). Since the comprehensive view of watershed planning has been used, however, this first purpose is complemented by others---for example, to "protect, conserve and improve the lands of the basin for more efficient production and use." To accomplish all of the purposes a cost of $8.5 billion is estimated---$3 billion allocated to the Federal Government, $.5 billion to State and local governments, and $5 billion in costs to landowners and operators.[14]

Directing the Missouri Basin Survey was no mean task for the Secretary's Office. The Soil Conservation Service opposed so broad an orientation. And most of the USDA agencies were poorly organized to operate on a project basis, especially a project whose bounds did not correspond to State and county lines. Gaining acceptance for the Missouri Basin Report from the USDA agencies, the Budget Bureau, and the Congress, has proved an even more difficult task. The many difficulties encountered are responsible in large part for the fact that the watershed reports prepared since have been less ambitious in their comprehensiveness, though they have continued to be considerably broader than would have resulted from a simple flood control engineering analysis. Thus, the reports on 15 watersheds, submitted to Congress between October 1951 and Julv 1952, are the product largelv of the SCS, though the Office of the Secretary, with varying degrees of success, guided the work, and field representatives of other agencies of the Department, such as State offices of the Production and Marketing

[14]Missouri Basin Report, pp. iii, 29-30. Emphasis added. This Report is so broad in scope that its authors cite three major and several minor authorities as the bases for the coordinated effort which produced it. Of the major authorities, one is the Flood Control Act of 1936. The other two define the Department's activities in the field of soil conservation generally.

Administration and of the Cooperative Extension Service, as well as Washington offices of these agencies were consulted and given an opportunity to review the reports. They include, in addition to measures designed to stabilize small watercourses, proposals for pasture establishment, fertilizing, farm ponds, wildlife area development, fire protection, etc.; and these measures are to be carried out by a variety of means, including extension education, incentive payments, and technical assistance.

THE BUDGET BUREAU OBJECTS

The rationale of even these more limited reports has failed to earn the approval of the Budget Bureau or the Congress. It contains a series of relationships to which, for different reasons, these units object. In essence the objectives as well as the programs recommended in the watershed *project* surveys cannot be distinguished definitively from *national* conservation and land productivity programs. Take for example the estimated benefits of the projects, as figured by the Department to comply with the project reporting requirements of the 1936 Act. Only five to twenty per cent of the benefits are for offsite flood control---i.e. benefits that result from the prevention of flood damages downstream from the lands on which the improvements are installed. Eightv to ninety-five per cent of the benefits accrue directly to the farmerson whose lands the many improvements are made, in terms largely of increased agricultural production, or more precisely, increased land productivitv.[15] Thus, the watershed *projects* overlap and duplicate the several *national* agricultural programs which are designed to improve land productivitv-the Soil Conservation program, the Agricultural Conservation Program, and to a degree the Extension Education and Farm Credit programs. Furthermore, the specific measures recommended in the *project* reports-terracing, strip cropping, forestry and range management, for example--and the techniques for installing and maintaining these--technical assistance, extension education, incentive payments--are very much the same as those used in the *national* programs. In effect, the watershed surveys provide for

[15] **Ref. (A), p. 38.**

One--a continuation of the normal national conservation programs for the area;

Two--an acceleration of these land treatment programs so that a certain level of conservation and productivity can be attained at an earlier date than would otherwise be the case;

Three--a new program for stabilizing small watercourses.

Part Three of the combination is the most unique. A greater percentage of its benefits than those of Parts One and TWO results from offsite flood prevention;[16] and its measures and techniques differ somewhat from those used in the national programs.

The Budget Bureau and the House Committee on Public Works have sought, in different ways, to limit authorization of watershed projects to the unique Part Three alone. The Secretary of Agriculture, on the other hand, has insisted on the combined authorization of Parts Two and Three (Part One is already authorized and underway). The three parts, he points out, are integrally connected. The small watershed structures and channel improvements (Part Three) cannot be installed on a watershed until the farmers have "substantially tied down" the land through the treatment measures proposed in Parts One and Two.[17]

"The Department, in formulating its watershed programs, seeks to adapt, intensify and accelerate proper land use and treatment. In some ways this is similar to what we are doing under the national programs of the Department. But. there is a vital difference. In watershed programs we work first on the watersheds with the biggest problems and where there is the biggest local interest in helping to meet them; and in each watershed we design and carry out a program which is properly balanced to give the greatest effects in reducing damages by erosion, floodwaters, and sediment. This procedure insures that necessary improvement work on watershed land is properly timed with the installation of supplemental runoff and waterflow retarding structures.

"The fact that we are recommending many of the same kinds of measures in our watershed programs as we advocate in our going national programs seems, however, to have caused some confusion.

[16]The analyses in the USDA reports do not make this point clear; but it is a fairly apparent and quite reasonable assumption.

[17]See Ref. (B) pp. 159-64 and Ref. (D), pp. 446-7. The quotation which follows is from Ref. [A), p. 6.

Actually, there is no inconsistency between the two kinds of programs. The land-treatment measures are the very essence of an adequate watershed program. ... Total erosion, floodwater, and sediment damage prevention and other benefits that can be achieved by adapting, intensifying, and accelerating the application of land-treatment measures to meet the peculiar needs of each watershed fully justify the recommendations we are making in our watershed survey reports to accomplish this end."

The Budget Bureau has raised objections to authorization of the project surveys because this might introduce "confusion in the presentation of the Department's budgetary program."[18] Following its parochial and statutory interest in the preparation and presentation of the President's Budget,[19] the Bureau fears the budgetary consequences of allowing Congress to authorize on a *project* basis, measures which may be carried out under existing authorizations for *national* programs. The most obvious of these consequences as far as Budget is concerned would be pressure for increased appropriations. Thus, if Congress were to authorize the Department's surveys (Parts Two and Three), then the Department could request funds to carry out this authorization under an appropriation entitled '*Flood Prevention," which would be in addition to the appropriations for the national conservation programs. If, on the other hand, Congress were to authorize only the unique engineering portion of each survey (Part Three), then the Department would be forced to request funds for the acceleration of land treatment on the watershed (Part Two), under the regular appropriations.

Secretary Brannan objected vigorously to the Budget position. He saw it as an effort to destroy the comprehensive approach which he had worked so hard to achieve within his own Department. Budget's position appeared to sacrifice the opportunity for a new broad policy for watershed programs for the advantage of consistency in budgetary presentation. Brannan put it this way:

"The Department has been confronted with proposals to restrict

18 **See Budget Bureau letters published in survey reports; for example,** that **in report on Brazos R. Watershed, Tex.**

19 **See this author's "In Accord with the Program of the President?" In** *Public Policy, Vol.* **IV, 1953.**

its recommendations for authorization of work under the flood-contolact to structural measures and to depend upon other programs and authorities for the land treatment work. We oppose such a course because we feel that the recommendations and authorizations should include a complete and balanced program of all needed kinds of improvement measures on a watershed basis and that this is necessary to set the stage for a balanced schedule for installation of measures from the timing standpoint.

"Accordingly, it is the position of the Department that it cannot meet the responsibilities imposed upon it by the flood-control acts or conform with the intent of Congress in enacting this legislation unless its investigations, reports, and recommendations are made with a view to developing complete programs of watershed improvement and protection. The test of whether a measure should be recommended for authorization under the flood-control acts is not whether it may be carried out by this Department under some other authority than the flood-control act but whether such measure is for the purpose of runoff and waterflow retardation and soil-erosion prevention. This is the criterion which this Department must follow in carrying out the objectives of the flood-control act. Any other approach would in our view thwart the plainly expressed intention of the Congress.

"In our opinion, merely stepping up the rate of appropriations for land-treatment measures is not enough. To get the right kind of job done, it is necessary to do it on a planned basis-first, a program for the entire watershed and, secondly, within the framework, work plans for individual subwatershed units. Then, on the basis of such watershed plans, we would seek appropriations to carry out the plans so that each type of measure, both the land-treatment measures and the supplemental structures, would be installed in their proper sequence and relation to one another. This is why we recommend in our survey report all of the kinds of watershed measures that go to make up an integrated program for accomplishing the objectives of soil-erosion, floodwater, and sediment-damage prevention."[20]

Though not stated explicitly, the Secretary also felt that Budget's approach put the Department in an impossible position with Congress and thus jeopardized any realization of a broad watershed program. Over a great many years the Department has worked out satisfactory arrangements with Congress (and other groups) for dividing up between the States

[20] Ref. **(A), p. 40.**

funds appropriated for national programs. The several hundred million dollar annual appropriation for the national Agricultural Conservation Program serves as an example. The allocation to each State, and indirectly to each county, is today based on an estimate of the conservation needs of the State for the practices included in the program. To insure, however, that the proportion of the funds allocated to any State does not vary significantly from year to year, Congress has provided that it may not be reduced by more than 15 per cent from that available in the previous year. And as a matter of practice the Department has seldom effected reductions of this magnitude. In the case of appropriations for the Soil Conservation Service. there is no legislative allocation among the States, but a certain level of assistance to the districts has come to be accepted. For Extension Education, funds are distributed to States on the basis of a series of formulae which include the variable factors of rural population and farm population, and certain fixed amounts prescribed in basic legislation.

By requiring USDA to seek funds for land treatment under the regular appropriation headings the Budget Bureau would force the Department. to abandon its present methods of fund allocation for several national programs and seek repeal of any legislative limitations which would impede this. The ACP appropriation, for example, would include a proportionately larger allocation of funds for those counties and States within certain watersheds where an accelerated program is planned. The Department's justification for this, however, could not be the authorization of such acceleration under a Flood Control Act, for this the Budget would prohibit. The justification would have to be made under the law providing for a national program. The Secretary's Office has argued that this arrangement invites failure for the watershed program. It would be very difficult to convince Members of Congress from States which do not have accelerated programs to vote extra money for those that do, especially since great pressure can be anticipated to keep the total ACP appropriation at a level no higher than the present, so that any funds voted for accelerated programs would come out of those that would otherwise be available for allocation to all States under the national program. If, on the other hand, the Department could secure authorization

of the accelerated programs under Flood Control Law, then it would have considerably less difficulty winning Congressional approval for funds carried under a separate appropriation heading. In other words, the Department has argued that it cannot adapt its operations to a project-by-project program *if* the Budget continues to hold to its position. But the Budget has remained adamant.

HOUSE COMMITTEE ON PUBLIC WORKS OBJECTS

The most severe criticism of the rationale of the watershed surveys has come from the Subcommittee to Study Civil Works of the House Committee on Public Works.[21] Whereas the Bureau of the Budget objected to the comprehensive surveys because they impaired clarity and purity in budgetary presentation, the House Committee on Public Works, following its parochial and statutory interests, objected because these surveys impaired the purity of the public works approach to flood control and consequently the clarity of the Committee's jurisdiction and that of the Corps of Engineers, the agency with which the Committee works most closely. Like Budget, the Committee on Public Works points out that "flood control" benefits, strictly defined, constitute a small portion of the total anticipated benefits from the projects recommended by the Department of Agriculture. Also, the Committee appears to be quite unimpressed with the desirability of a comprehensive approach and with the relatedness of the several parts of each of the USDA surveys. In effect, the Committee would like to assume responsibility for the structural measures and absolve itself from any concern with land treatment, leaving this to the Committee on Agriculture.

Thus, "the Subcommittee believes that flood control programs of the nature contemplated in the flood control acts should continue to come before the Committee on Public Works, but is opposed to having land productivy measures, a non public *works function,* included to such a large extent."

Referring to the fact that the Department had tried to get a hearing before the Committee on Agriculture for several of its survey reports, the Committee on Public Works said:

21 **See its report (Ref A). Quotations that follow in this section are** from the **report unless otherwise indicated. Emphases are added.**

"It would appear that the Department of Agriculture's action was actually based on its anticipation that the Committee on Public Works would be inclined to consider only *public works features* and would not be willing to load down flood control legislation with authorizations that were not strictly relevant to *responsibilities of the Committee.* This anticipation is reasonably sound since the Committee had objected to this attempt to force it either to take no jurisdiction over a program at all or be *obliged to* pass on agricultural *measures* as well as flood *control works."*

The Committee would clarify the present confusion by limiting the flood control authority of the Department of Agriculture and expanding that of the Corps of Engineers:

"The Subcommittee believes that the supervision of Federal improvements for flood control should remain in one agency and the responsibility should not be dissipated by the authorization of uncoordinated segments of flood control work by other agencies."[22]

Present authority of the Department to make flood control surveys in accordance with the Act of 1936 would be cancelled. Instead the Corps of Engineers would be directed to "include in their reports, with their comments thereon, a statement from the Secretary of Agriculture as to specific *structural improvements,* their costs, purposes, and benefits, recommended by him to provide related runoff and waterflow retardation and soil erosion prevention works, as supplementary to any program recommended by the Chief of Engineers." The Corps would receive all appropriations for flood control surveys and would transfer to the Department funds necessary to finance its studies.

As for the non-structural aspects of Agriculture's programs, "the Subcommittee recognizes that some legislation, presumably sponsored by the Committee on Agriculture, would be necessary to provide for an accelerated program of soil conservation and water retardation work on upstream lands";[23] but it feels that this is not very closely related to flood control :

22 82nd Congress, 2nd Session, House Committee on Public Works, Subcommittee **to** Study Civil Works, Statement on House Committee Print No. 22 (mimeo., n.d.), p. 3.

23 Statement of Rep. Robert E. Jones, Jr., Chairman, Subcommittee to Study Civil Works, entitled "Press Comment on Jones Subcommittee Report on Flood Control Program of the Department of Agriculture" (mimeo., n.d., but Feb., 1953).

"The Subcommittee considers that soil conservation in itself is a most important activity. The welfare of the nation requires that sound practices for the conservation of the fertility of the soil be undertaken. The need is sufficiently important that it does not need to be disguised as flood control. The unnecessary confusion introduced by improperly commingling the two phases of conservation must stop."

HOUSE COMMITTEE ON AGRICULTURE IS AMBIVALENT

The watershed program has presented real difficulties for the House Committee on Agriculture; for that Committee is not used to dealing with *projects*; but rather, with ***national*** agricultural *programs.* Also, the Committee has never been certain of its jurisdiction, if any, over the project reports and over any legislation that might result from them. The eleven watershed surveys submitted to Congress before the end of World War II were referred without question to the House Committee on Flood Control, predecessor of the Committee on Public Works; and it was this committee and its counterpart in the Senate which recommended authorization of the projects in the Flood Control Act of 1944. The comprehensive character of the post-war reports gave rise to the question of committee jurisdiction. The first and most comprehensive, that on the Missouri Basin was referred to the Committee on Agriculture. The next eleven survey reports, submitted to Congress over two years later, were referred to the Committee on Public Works, after some complicated parliamentary maneuvering involving the Soil Conservation Service and the Office of the Secretary in the Department of Agriculture and the Committees on Agriculture and Public Works and the parliamentarian in the House of Representatives. Finally, the last surveys submitted to the 82nd Congress, those on five watersheds within the Missouri Basin, were referred to the Committee on Agriculture; they were treated as supplements to the comprehensive Missouri Report.

Upon receipt of the Missouri Basin Report, the Agriculture Committee, and its Subcommittee on Watershed Programs chaired by Mr. Poage of Texas, began to consider the types of legislation that might be prepared to accomplish the work

recommended in the surveys.[24] One alternative was for the Committee to prepare omnibus watershed flood control acts in which the Congress would approve and authorize USDA survey reports in the same manner that the Committee on Public Works prepares rivers and harbors and flood control bills authorizing the Corps' survey reports. It appeared to many in the Department of Agriculture that the Committee could and would follow this course; and that in this procedure the Agriculture Committee would be more favorable to the Department's programs than the Committee on Public Works. This accounts in large part for the parliamentary scramble over referral of reports, and for the following complaint of the House Committee on Public Works:

"Apparently as an outgrowth of criticisms by the Public Works Committee of the form and content of the current type of report, elements of the Department of Agriculture have determined that their proposals have greater chance of success if handled by the Committee on Agriculture. The statement has been made that the Department of Agriculture considers the Committee on Agriculture more receptive to the programs and so anticipates that appropriations will be more readily forthcoming."[25]

But the Committee on Agriculture soon made it clear that it was not prepared to deal with the watershed problem on a project authorization basis. Instead, as is its wont on other agricultural matters, the Committee preferred to deal with watershed flood control by legislation authorizing a national program. The details of this proposed legislation will be spelled out later.

WATERSHEDS V. DAMS

To what extent, if at all, has the upstream-downstream controversy contributed to the views of the Budget Bureau and the Congressional committees and to the failure of the Department of Agriculture to absorb successfully the watershed program initiated with the Act of 1936? The nature of this public debate should be familiar to all readers.[26] On the one hand are

24 For a brief summary of the Committee's activities in this regard see House Report 2222, 82nd Congress.

25 Ref. (A), p. 38.

26 An excellent analysis of this problem is found in Ref. (A). Quotations in this section, unless otherwise cited, are from this report.

those who consider flood prevention as a problem that begins and ends where the rain falls--on the tributary watershed. A program to "restore nature's reservoir," the soil, so that it can hold the rain and check the runoff, supplemented where necessary by upstream "little dams," will not only prevent the large amount of annual flood damage that occurs on farm lands in the watershed, they argue, but will also make unnecessary the construction of large storage reservoirs on main channels. Watershed projects can either stop the floods completely or can so delay them that when the floods reach the cities they can be channeled safely through levees alone. Watershed projects instead of big dams, is the program of these proponents. On the other hand there are those who argue that in most areas of the country watershed programs will contribute little to downstream protection of large cities; that their major effect is the prevention of flood damages to the rural lands on which the watershed measures are applied; and that this effect is measured largely in terms of the increased agricultural productivity of these watershed lands. Even if "nature's reservoir" were in the most perfect of conditions it could not retain all of the rain that falls in heavy storms. There were floods in the Mississippi Valley before white man started plowing up the ground. Storms move around so irregularly in any watershed that great numbers of the little dams are likely to be outside of the area of any particular rainfall and thus provide no protection at all.

Proponents of the first view include farmers facing inundation by mainstream dams, private utilities which oppose large Federal dams that might produce public power, "anti-big-anything people," and certain conservation organizations and groups of sincere watershed farmers. Proponents of the second view include city residents and business men and, by their official pronouncements, *all* of the interested agencies of the Federal Government. The Department's survey reports claim very little in the way of downstream flood protection. Remember that only 5 to 20 per cent of the benefits are offsite; 80 to 95 per cent are on the watershed lands'. Also, officials of the Soil Conservation Service and of the Secretarv's Office have tried to make it clear to committees of Congress-ever since 1942 that upstream works cannot give adequate protection to a river basin and are not a substitute for downstream dams and

channel works needed to protect urban centers.[27] The historic importance of this conclusion by USDA should not be overlooked. Almost since the turn of the century friends of the Forest Service and conservation organizations had been proposing land treatment as a means of controlling major floods. In 1936 their great fight was won in a sense; the Department of Agriculture was given an important, if poorly defined, role in the national flood program. Between 1937 and 1941 the Department strove to make the big stride from conviction to science and, after much soul searching and some painful internal altercations, reached the conclusion that land treatment could not reduce major floods very much. This conclusion came quietly in the restrained language of the technical people, leaving public opinion almost untouched.

In the light of these facts can it be said that the watershed v. dams controversy has contributed to the Department's failure to get an active watershed program underway? It may be true that the public controversy has given reviewing authorities, such as the Budget and Congress, an excuse to delay action. It may be also that active opposition by the dam building agencies and their friends to any groups that advocate watersheds instead of dams has been interpreted mistakenly by many as opposition to the Department's watershed program. Controversies such as this breed confusion, and confusion can do great harm to a cause which requires positive legislation. Furthermore it is true that the Corps of Engineers and the House Committee on Public Works have expressed serious doubts about the engineering and economic adequacy of the little dams proposed as part of Agriculture's program for stabilizing small watersheds.

On the other hand, the Department has profited from the activities of the watersheds-instead-of-dams groups. They have been able to focus national attention on the paucity of Federal funds spent for watershed flood control in contrast to those

[27] See in addition to Ref (A), testimony of Chief, SCS, in Ref. (D), p. *444;* of Dy. Chief, SCS, before 83rd Congress, 2nd Session, House Subcommittee on Agricultural Appropriations, Vol. 4, pp. 1872-3; of assoc. Ianduse coordinator, USDA, before 78th Congress, 2nd Session, House Committee on Flood Control, Hearings on Flood Control, p. 1119. Also, Howard L. Cook, "The Effects of Land Management Upon Run-Off and Ground-Water," in *Proc. U. N. Sci. Conf. on the Conservation and Utilization of Resources* (1951), Vol. IV, pp. 193-202, and the references cited therein.

spent for big dams. To a considerable degree it is they who successfully impressed upon Congress in I953 the urgency for action on watershed legislation. Though the Department in Washington has continually rejected the platform of these groups, there is evidence that certain SCS officers in Washington and the field have encouraged it. After taking considerable testimony on this point the House Subcommittee on Civil Works concluded somewhat obliquely: "... the Subcommittee has not been able to understand why the people in the watersheds have continually supported the proposition that the Department can give them total flood control over the entire river if somewhere along the line the Department did not lendthem some encouragement." The Committee pointed to the case of Kansas and Tuttle Creek Dam and cited evidence that the "agencies have contributed to confusion over the effectiveness of upstream works." Commenting on the influence of Elmer T. Peterson, a prominent spokesman of the watersheds-instead-of-dams groups, the Committee said:

"Other elements of the Department ["other" than the Secretary's Office], how-ever, have expressed the opinion that while Mr. Peterson and his followers are perhaps overly zealous and inclined to over-exaggeration, probably the upstream program would languish in the planning stage if the more rabid supporters of the watershed scheme did not arouse the farmers, the President, and the Congress."

On balance it is my opinion that the watershed v. dams controversy has not been a significant factor in the failure of the Agriculture Department to gain approval for an active program of watershed flood control. And in any case, the importance of this controversy cannot compare to that of factors traced previously.

20 JANUARY 1953--A COLOSSAL IMPASSE

As Secretary Brannan and the Truman Administration departed Washington on 20 January 1953 the situation on watershed flood control could be described as a colossal impasse. The Department had submitted to Congress since resumption of survey activities after World War II project reports on 15 watersheds. Ten of these were before the H&se Committee on

Public Works whose special subcommittee had criticized them severely, failed to recommend their authorization, and proposed an end to the procedure under which they had been prepared. Reports on 5 watersheds were before the House Committee on Agriculture which had decided against adopting a project authorization approach to the problem but had not worked out a satisfactory alternative. And there were jurisdictional conflicts and jealousies between the two legislative committees.

The Budget Bureau, as the President's staff agency, had. done nothing positive to help get the watershed program unclerway. As the Department viewed Budget's actions, they were entirely negative and contributed to the impasse. There was no real agreement within the Department of Agriculture; the Office of the Secretary and the SCS were at odds over the rationale and strategy of the program.

The Department's postwar "new look" on the watershed survey-the comprehensive report-was under vicious attack at all points. The Budget Bureau had inserted the scalpel into the land treatment portion of the reports; and the House Subcommittee on Civil Works had given it a healthy twist. The Corps of Engineers had pricked the skin of the small watercourse portion of the reports; and the House Subcommittee had inserted the scalpel deep. Finally, the Budget Bureau and the House Committee had severed the two parts with a sharp blade so that combined or comprehensive consideration was impossible

At the very time that the impasse was becoming immense in proportions, public demand for some sort of Federal action on the watershed conservation front was rising rapidly. Robert Salter, Chief of the SCS, reported to Congress early in 1953 on the growth in the last two years of local interest in watershed programs. His organization had made a survey in January of 1953 and had found more than 300 organized watershed associations (i.e. those having elected officers and boards of directors and bylaws) and more than 500 informal watershed groups. The 300 organized associations covered 350 million acres and about 1.5 million farms and ranches; thev were well distributed geographically; and almost 50 per cent of them had legal status of one form or another. Many of these groups were misguided, to be sure: "Of course, there are some people out there who mis-

takenly believe these upper watershed programs will effectively control these enormous floods, which they will not do"; but they were demanding some sort of action.[28]

The impasse was so great that Secretary Brannan and President Truman in the Budget for fiscal year 1954, recommended that Congress appropriate funds to initiate action on 7 new watersheds, which were the subject of survey reports pending before the House committees (6 reports were before the House Committee on Public Works; 1 before the House Committee on Agriculture). They proposed that the work be carried out under authorities already available to the Department, since **the** reports had not been authorized under the Flood Control Act. This recommendation was eliminated from the Budget by the new Administration, which further proposed a reduction in the appropriations for continuing work on the 11 authorized projects, and a heavy cut in the funds recommended for continuing the Department's survey work.

It was in this atmosphere that Representative Hope opened Agriculture Committee hearings on "Conservation and Water**shed** Programs" on 28 April 1953. In his introductory state**ment he** said:

"We are convinced, in short, that we have reached the time for action in our upstream soil conservation, water utilization, flood prevention program. We hope that these hearings will help us to chart the course of that activity with certainty. . . .

"Under the specific authorizations of the Flood Control Act the Department of Agriculture has expended some $18 million in making studies, surveys, and reports. These have resulted in the start of exactly 11 projects, which were authorized in 1944.

"In spite of the millions of dollars which have been spent in surveying and resurveying virtually every major watercourse in the United States, we are no nearer action on most of them than we were 17 years ago. In spite of thousands of conferences between representatives of agencies who agree on broad plans for river valley development, we are no nearer agreement on the practical blueprints for action than we were before the Flood Control Act was passed.

"It seems clear to us, therefore, that now is the time to begin to put some of our plans into action and we hope that these hearings

[28] Ref. (D), pp. 447,442.

will give the Committee and the Congress a clearer view of just what that action should be."[29]

The action taken to cure the evils of the Act of 1936 will be discussed in the following section. Just remember here the major cause of failure: The Department had been unable to adjust to a project-by-project, in contrast to a national, approach to an agricultural problem. This is attributed to certain conflicts within the Department as well as to the Department's relations with other units of the Executive branch, the Congress, and its clientele. The Secretary's Office had sought to mesh the watershed approach with the national conservation approach by developing "comprehensive, unified, multiple purpose plans" through which the Department's conservation activities could be "tailored" to meet the needs of major agricultural regions. The Soil Conservation Service had taken a more limited or single purpose view of desirable watershed planning and in doing so reduced, though it could not eliminate, the meshing problem. Augmenting this basic difference were conflicting views on how watershed conservation should be installed-by what practices and what methods of dealing with farmers; how it should be authorized by Congress; what agencies should do the planning-whether it should be a joint undertaking of several USDA bureaus or assigned to a single bureau;[30] and how coordination with other Federal agencies should be achieved.

THE USDA AND THE FIRST SESSION OF THE 83RD CONGRESS

On 1 April 1953 Secretary Benson transferred to the Soil Conservation Service general responsibility for all work under the Flood Control Acts and abolished the land and water resources staff in the Secretary's Office.[31]

On 23 July 1953 the House and Senate approved a Conference Report on the Agriculture Department Appropriations Bill which included an item of $5 million to start a "pilot plant" program of watershed protection on 50 small watersheds in

29 Ref. (B), p. 3.

30 The Soil Conservation and Forest Services feared that joint planning, requiring coordination of activities, might reduce cherished agency autonomy.

31 This staff was a direct descendant and the last remnant of the Office of Land Use Coordination, organized under the leadership of Milton Eisenhower.

28 States. There was no special legislative authority for this; so the broad provisions of the soil conservation Act of 1935 were relied on. How did an economy-minded 83rd Congress come to initiate an appropriation for a new, unbudgeted, and in a sense unauthorized agricultural program? The November election in Kansas' First Congressional District is important in this connection; and it symbolizes the answer. Albert Cole, Republican, had represented this District in northeast Kansas since 1945. In each of his four elections he had received almost twice the votes of his Democratic opponent--roughly 70 to 35 thousands. Cole ran for the 83rd Congress, seeking a fifth term; but in the year of the great Republican sweep of the nation he lost to a Democrat by a vote in thousands of 65 to 69. For the first time in historv the First District of Kansas was represented by a Democrat. Albert Cole's defeat has been attributed to his support of the Army Engineers and their Tuttle Creek flood control dam under construction on the Big Blue River. His adversary, Howard Miller, president of the Walnut Creek Watershed Association, opposed this dam which, when in full use, would flood out tens of thousands of acres of rural land in the First District to help provide flood protection for Manhattan, Topeka, and Greater Kansas City. In opposing the dam Howard Miller supported counter proposals to control flood waters on the Big Blue by soil conservation and land use measures. Cole had himself opposed the Tuttle Creek dam until some time after the great floods of 1951 when he became convinced that the watershed program, though important of itself, would not provide adequate protection for the urban centers; and his position was upheld by the Department of Agriculture in Washington though there is evidence that certain Department representatives in the area lent support to Miller's position. But the details are not important here. The point is that Albert Cole's defeat alerted many in Congress to the political significance of the public interest in watershed programs; and it, along with the advent of a new Administration which promised to emphasize "local interests" in resources programs, gave an impetus to the groups seeking new watershed legislation.

On 4 February 1953 the Water Management Committee of the National Association of Soil Conservation Districts, meet-

ing in Omaha, Nebraska, voted that the President of the United States should recommend to the Congress new legislation establishing uniform standards for a watershed flood control program. It voted also, however, "to immediately readjust the 1954 budget of the Department of Agriculture, without increases, to provide for assistance in flood prevention and related land treatment in small watersheds upon application of local agencies."[32] The NASCD was soon joined in its resolves by others interested in watershed legislation and together they formed the National Informal Citizens Committee on Watershed Conservation. Raymond A. McConnell, Jr., editor of the *Lincoln* (Nebraska) *Evening Journal* and co-chairman of the Salt-Wahoo Watershed Association, became leader of this informal group. At his suggestion they met in Washington on 25 February for discussions with President Eisenhower, the Secretaries of Agriculture and Interior, the Chief of Engineers, and the Director of the Budget. Thev proposed that a sum be made available directly for a small wateshed program. Mr. McConnell reports that "at that time we urged upon the President that true economy lies in this type of approach and its complete consistency with the philosophy underlying the new Administration."[33]

The group did not win their point immediately, for the revised Eisenhower Budget failed to include any funds for the small watersheds; in fact it cut back quite heavily on all watershed activities. However, on 29 April, the last day of scheduled hearings on Agriculture appropriations, Representative Hope, Chairman of the House Agriculture Committee, and Senator Carlson, both from Albert Cole's State of Kansas, appeared before the House Committee on Appropriations and made an urgent request for a $5 million fund to start work on 50 small watersheds. With their active support and that of Mr. McConnell's committee, many of whom returned to Washington at the time of the appropriation hearings, the money was voted by Congress.[34]

The position of the Eisenhower Administration on this somewhat unusual procedure is not entirely clear. Congressman

32 See Ref. (B), pp. 154-5.
33 Ref. (D), p. 1056.
34 Material on the legislative history of this appropriation from Ref. (C), pp. 581-93, 610-50; Ref. (D), pp. 1052-62, 1192-6; and the committee reports.

Hope **told** the House Committee on Appropriations that the program had not been approved by the Department of Agriculture or by the Budget Bureau. Senator Carlson told the Senate Committee that: "Before Congressman Hope and I presented this proposal to the House Committee, we discussed the matter with the President of the United States and officials in the Department of Agriculture. We have the enthusiastic approval of the President and have had the full cooperation of the Department of Agriculture." Apparently, the White House was more receptive to the proposals than the Department.

Can this new small watershed program be said to constitute an element in a long range solution to the impasse of 1953? Or is it more nearly an isolated special purpose action? Representative Hope in presenting his proposal, the Soil Conservation Service in supporting it, and the House Committee on Appropriations and the House-Senate Conference Committee in approving it, all spoke of a "pilot plant" or "demonstration."[35] There are good reasons to believe, however, that the "demonstration" was conceived by many of its supporters as a start on a new permanent program rather than a laboratory experiment. In the first place, it is similar in most respects to the proposed permanent legislation introduced by Representative Hope on 27 April. Mr. Hope called for hearings before the Agriculture Committee on this bill the very next day; and on 29 April, apparently with the support of the Agriculture Committee, he appeared before the Committee on Appropriations, "convinced that the country is far ahead of the Congress on this subject." Since there was no specific legislative authority for the appropriation proposal and its supporters were forced to rely on the broad provisions of the Soil Conservation Act of 1935, since specific legislative authority was, however, pending before the Committee on Agriculture, and since the first session of the 83rd Congress was bent on economy and not amenable to appropriating funds for new legislative programs, it probably was essential for purposes of strategy, if for no other reasons, to call the proposal a "pilot plant" or "demonstration."

Second, some of those who used the description, "demonstration," (including Mr. Dykes of the SCS, Mr. McConnell, and

35 For Hope, Ref. (C), pp. 588, 646; for SCS, Ref. (C), p 643; for House Com. Approps., House Rpt. 422, 83rd Congress; for Conference Corn., House Rpt. 900, 83rd Congress.

in part Mr. Hope) did not mean experiment, but rather an effort to demonstrate the advantages of a watershed program to the entire nation through a series of small projects "widely scattered," "into areas where all the **people could see** the work," "from South Carolina to California and from Minnesota to Texas."[36]

Finally, the important Congressional leaders urged the basic significance of the appropriation. Chairman Hope of the legislative committee said to **the Appropriations** Committee : : I believe that this appropriation, if made, will constitute a *landmark in* the history of ***conservation legislation*** **in this** country. I implore you to give it favorable consideration." And Chairman Andersen of Agriculture Apporpriations Subcommittee said to his colleagues and to representatives of the SCS: "I might say here that I hope that this is the beginning of a long range program which will provide for a lot of this necessary work. This has been too long delayed."[37]

It is safe to conclude, then, that the $5 million appropriation was intended as a prominent first step in a solution to the impasse we have described. As such we should determine if it encompasses the ingredients of success.

A NATIONAL PROGRAM?

To what extent is the new program a national one which the USDA can administer without violating its traditional relationships? It proposes to distribute its benefits widely. The concern is with small watersheds, and a large number of these can be included in an annual budgetary program of reasonable size. The $5 million voted for fiscal year 1954 is to be spent on 50

[36] For Dykes Ref. (C) p. 642; for McConnell, Ref. (C), p. 36; for Hope, Ref. (C), p. 585.

Technically it is highly doubtful that the watershed "pilotplants," as planned by SCS, could ever be used to determine the effects on flood runoff of the measures installed. To do this it is necessary to measure rainfall and runoff over a period of years both before and after the program is installed.

It is interesting to note here that the "demonstration projects" developed by the Soil Erosion Service and the Soil Conservation Service in its earliest days came to he of strategic importance in encouraging the formation of soil conservation districts after the States had passed their district enabling acts. The demonstration project approach, in other words, has worked once before to set off a rapidly expanding program.

[37] For Hope Ref (C), p. 585; for Andersen, Ref. (C), p. 641. Emphasis added.

watersheds in 28 States, fairly well distributed over the major Agricultural areas of the United States.[38] The operating unit for the program is the soil conservation district, and since in most States the boundaries of districts correspond to, or are included within those of counties and in no instance do they cross over those of States, the program appears to conform to a workable and accepted administrative pattern for the Department. In mid-September the SCS compiled a list of 39 watersheds for which negotiations with the local sponsoring agencies were well along. For 31 of these the sponsoring agencies are single soil conservation districts, and only 7 of the districts have jurisdiction over areas that cut across county lines. For 6 watersheds, the sponsors are 2 soil conservation districts jointly, and in only one case does the jurisdiction of the sponsors cut across county lines. For one watershed the sponsor is 3 districts jointly, and their jurisdictions are confined within county boundaries. The sponsor is an agency other than an organized SCD for only one watershed, and it is Mr. McConnell's Salt-Wahoo Association in Nebraska. Apparently the rapid spawning of formal and informal watershed groups, noted by SCS Chief Salter, has little to do with the administration of the new program. The well-organized SCDs have taken charge.

The program abandons the whole concept of individual project authorizations and with it the need for public works reports, benefit-cost ratios, and report clearances. Neither the language of the appropriation nor the reports of the Appropriations Committees mention the watersheds by name; considerable flexibility is left with the SCS. Though the Service may decide to use a very general form of the benefit-cost ratio as a means of internal administration, it is not required to defend the precision of these calculations before the Congress. At the present time (September 1953), the Department does not intend to submit small watershed reports to the Bureau of the Budget for project clearance under EO 9384, nor to the Federal Interagency River Basin Committee, though certain Budget staff members think that the Department should be required to do so.

[38] The number of watersheds is not prescribed in the appropriation language **and** will likely exceed 50 before all funds are committed.

A PROGRAM THAT WILL ENJOY LEGISLATIVE SUPPORT?

To what extent is the new program one that is likely to receive encouragement from the committees of Congress? The program was initiated by the House Committee on Appropriations at the urgent request of the chairman of the House Committee on Agriculture. A sympathetic Committee on Agriculture has assumed jurisdiction rather than an unsympathetic Committee on Public Works. The Agriculture Committee will soon consider Chairman Hope's bill which would repeal the USDA's watershed survey authority under the Flood Control Act of 1936, and instead provide a permanent authorization for the program now underway, thereby removing from it the descriptive qualification, "pilot plant."[39]

There are several respects in which the Hope bill differs from the current appropriations program, and it might be well to mention them here though some are likely to undergo modification in the legislative process. The bill requires that, before the Secretary of Agriculture commences any watershed work involving Federal assistance, he shall transmit a copy of the plan and the justification therefor to the Congress through the President. The Congress does not authorize or approve the plan; rather do its legislative and appropriations committees receive it for information. In supporting the appropriation for 50 watersheds this year the Soil Conservation Service submitted to the Appropriations Committees brief descriptions and justifications for each, and in a sense the Hope bill formalizes this normal procedure. However, the very formality will likely require the preparation of more rigid and detailed reports, and the Department will have to steer a careful course if it is to avoid that tortuous maze of public works project reporting with which it has been unable to cope in the past. In this connection two further provisions of the Hope bill should be pointed out. It requires that the Secretary determine "that the flood prevention and soil conservation benefits exceed their costs" before the Department participates in a watershed program. This appears to be a very general demand, but again

[39] The bill introduced on 27 April was H.R. 4877. It was similar to the Poage bill on which hearings had been held in the previous session of Congress. Minor revisions have since been made, and the bill was reintroduced on 1 August 1953 as H.R. 6788. The companion bill in the Senate is S. 2549, introduced by Chairman Aiken of the Committee on Agriculture and Forestry.

the Department will have to steer a careful course to avoid a rigorous application of public works project economics to its activities. Finally, the bill requires that the reports to Congress be transmitted through the President. This means through the Budget Bureau; and the Bureau has stated, in a letter to the Committee on Agriculture on the bill, that "the proposed projects would be reviewed bv the Executive Office of the President under Executive Order 9384." Unless the Bureau revises its approach to review of watershed projects, a permanent program may run into difficulties here. Also, unless the Budget desists from requiring that funds for watershed programs be divided up among several appropriation items, the Department may find it difficult to sustain the support of the Committees on Appropriations.

The Budget Bureau, as the President's agent for clearance of legislation, has recommended favorable consideration of the watershed bill by Representative Hope's committee; and the President in a message to the 83rd Congress in the closing days of its first session supported the bill's principles.[40]

A PROGRAM THAT WILL BRING CONCORD TO THE USDA?

To what extent is the new program one that will bring harmony to the Department of Agriculture? It concentrates responsibility in the Soil Conservation Service. This combined with the Secretary's order transferring the watershed functions of the Office of the Secretary to the SCS should end many disagreements of the past. But new ones can be foreseen. If the program grows rapidly it will mean more power for the SCS, and, more important, for the soil conservation districts. As such it strengthens these agencies as against Extension and the Farm Bureau in what Charles Hardin called "The Struggle for Power in Rural America."[41] Anyone familiar with Hardin's analysis can project the broad problems that will be raised by a significant increase in the power of the "land doctors" and their districts and can speculate on alternative solutions, but such analyses, projections, and speculations are beyond the scope of this paper.

40 Budget Bureau letter to Chairman, House Committee on Agriculture, 31 August 1953. President's message to Congress, 31 July 1953, House Doc. 221, 83rd Congress.

41 This is the subtitle of his ***Politics of Agriculture,*** *op. cit.*

A COMPREHENSIVE PROGRAM?

Admitting, then, that the strategy of success is built into the new program- i t is national in scope and organization and will enjoy legislative and executive support-to what extent does it retain the substance of the postwar comprehensive approach to watershed conservation? The program for most of the 50 small watersheds includes measures for both acceleration of land treatment and small watercourse stabilization. The upstream engineering techniques for the stabilizing measures, for which the Federal Government will pay full costs except lands, are the same as those contemplated in the wider watershed surveys. But those for the accelerated land treatment are considerably more limited. Whereas the comprehensive programs contemplated Federal expenditures for a combination of technical assistance through the SCS, education through the Cooperative Extension Service, conservation payments through the ACP, and other means, the new small watershed programs provide for technical assistance through the Soil Conservation Service only. Mr. Hope has testified that of a total Federal cost of $29 million for the 50 watersheds (the $5 million appropriated in 1953 is a first year start), $24 million are for the structural measures and $5 million for intensifying land treatment, a ratio of roughly 5 to 1 in favor of the structures. Compare this to the Federal expenditures proposed in the most recent comprehensive watershed surveys :

Watershed	Federal Cost for Structures (in $million)	Federal Cost for Accelerated Land Treatment (in $ million)	Ratio of Structures to Land Treatment
Salt-Wahoo Crks., Neb.	62	**10.8**	**1:1.7**
Blue R., Kan.-Neb.	**17.5**	**39.2**	**1:2.2**
Upper So. Platte R., Col.	8.7	39.1	**1:4.5**
Osage **R.,** Kan.-Mo.	55.5	62.0	**1:1.1**
New program of 50 small watersheds	**24.0**	4.7	**1:0.2**

The new program, then, is considerably less comprehensive than that of the Brannan era. It is, in the words of its supporters, "a watershed program under the Soil Conservation Service," and as such it utilizes only the techniques and instrumentalities of that Service. It is hardly broad enough **to**

provide a framework for the farm and home planning approach to conservation on the individual farm.

Furthermore, since the new program places such great emphasis on the soil conservation district, the river basin orientation of the comprehensive surveys is fairly well forfeited. Most of the supporters of the new program envision a status in which the SCS is prepared to install a "watershed **program" in** *any* district that makes application and is itself prepared to meet the requirements for local participation. By scattering its services in this way, to make up a national program, the SCS could scarcely put together broad river basin plans, designed to complement the river engineering work of the Corps of Engineers and the Bureau of Reclamation. Of course, a close or complementary relationship between watershed programs and river developments has never been established in the USDA comprehensive surveys. Eighty to 95 per cent of the benefits accrue to the farm land owners; only 5 to 15 per cent are assignable to offsite protection. Under these circumstances forfeiture of river basin orientation may be inevitable and insignificant. In certain cases, however, the ultimate installation of small watercourse stabilizing measures over an entire watershed may so alter the pattern of flood runoff that it should be planned in conjunction with the main stem storage reservoirs and levees. Such coordinated planning would be extremely difficult to achieve under the new program.

In the light of this analysis, the new watershed program may well boil down to little more than a *national* program authorizing the SCS to provide an additional service to any of its customers, the soil conservation districts, who wish it. At present the Service is pretty well limited to providing the districts with technical assistance, and the new program will expand this only slightly. Under the new program, however, the Service can offer in addition to plan and to pay for the total construction costs (not including land) of small watercourse stabilizing measures in districts that initiate a request for these. Several districts may choose to join for the purpose of requesting the new service, and they may designate themselves a watershed association, but the basic operating unit will remain the district.

The Hope bill would authorize a program somewhat broader

in substance than that being carried out under the current appropriation. The Secretary of Agriculture could "cooperate and enter into agreements with and furnish financial and other assistance to local organizations." However, the other provisions of the bill and its general tenor, as well as the stated objectives of most of those who support it, suggest the strong possibility that the broader terms of the authorization, if enacted, may never be used. The die may well be cast.

BIBLIOGRAPHIC NOTE

The following documents, cited most frequently in this article, are identified throughout by the indicators noted in the left hand column.

Indicator	Document
Ref. (A)	82nd Congress, 2nd Session, House Committee on Public Works, Subcommittee to Study Civil Works, Report on the Flood Control Program of the Department of Agriculture, 5 December 1952, House Committee Print No. 22.
Ref. (B)	83rd Congress, First Session, House Committee on Agriculture, Hearings on Conservation and Watershed Programs, Series H.
Ref. (C)	83rd Congress, First Session, House Committee on Appropriations, Subcommittee on Agricultural Appropriations, Hearings on Departmen t of Agriculture Appropriations for 1954, Part 5.
Ref. (D)	83rd Congress, First Session, Senate Committee on Appropriations, Subcommittee on Agricultural Appropriations, Hearings on Agricultural Appropriatons for 1954.

Frequent reference is made throughout the article to the sixteen USDA watershed survey reports submitted to Congress after World War II. These reports are identified below and will be mentioned by name only in the text.

Watershed	Date Submitted	Referred to	Doc. No.
Missouri River Basin	9/29/49	H. Com. Agric.	H. Doc. 373, 81/1
Green R., Ky. & Tenn.	10/19/51	H. Com. Pub. Wks.	H. Doc. 261, 82/1
Grand (Neosho) R., Okla.	2/27/52	H. Com. Pub. Wks.	H. Doc. 388, 82/2
Brazos R., Tex.	3/10/52	H. Corn. Pub. Wks.	H. Doc. 396, 82/2
Pee Dee R., Va., N. C., & S. c.	3/10/52	H. Com. Pub. Wks.	H. Doc. 395, 82/2
Sny, Ill.	3/10/52	H. Com. Pub. Wks.	H. Doc. 398, 82/2
Queen Crk., Ariz.	3/10/52	H. Com. Pub. Wks.	H. Doc. 397, 82/2
Delaware R., N. Y., N. J., Pa., etc.	3/19/52	H. Com. Pub. Wks.	H. Doc. 405, 82/2
Sevier Lake, Utah	3/19/52	H. Com. Pub. Wks.	H. Doc. 406, 82/2
Scioto R., Ohio	3/19/52	H. Com. Pub. Wks.	H. Doc. 409, 82/2
Pecos R., N. M. & Tex.	5/20/52	H. Com. Pub. Wks.	H. Doc. 475, 82/2
*Salt-Wahoo Crks., Neb.	7/3/52	H. Com. Agric.	H. Doc. 530, 82/2
*Blue R., Neb. & Kan.	7/3/52	H. Com. Agric.	H. Doc. 530, 82/2
*Upper South Platte., Colo. & wyo.	7/3/52	H. Com. Agric.	H. Doc. 530, 82/2
*Osage R., Kan. & Mo.	7/3/52	H. Com. Agric.	H. Doc. 530, 82/2
*Five Mile Crk., Wyo.	7/3/52	H. Com. Agric.	H. Doc. 530, 82/2

* Reports on these 5 watershed submitted in one document entitled "Supplemental Report, Missouri River Basin Agricultural Program."

Appendix C

"BENEFIT-COST ANALYSIS: ITS RELEVANCE TO PUBLIC INVESTMENT DECISIONS"

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Benefit-Cost Analysis Its Relevance to Public Investment Decisions

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The U.S. government has for some time used benefit-cost analysis in the design and justification of dams and other water resources improvements. Currently the government is trying to adapt the technique to other public investment programs. At the request of the Bureau of the Budget, The Brookings Institution held a major conference on the topic in November 1963, with papers on applying benefit-cost analysis to urban highways, urban renewal, outdoor recreation, civil aviation, government research and development, and public health [ref. 1]. In 1965 the Bureau of the Budget established a special unit to adapt and apply benefit-cost and cost-effectiveness studies to a broad range of government programs. It is appropriate. therefore, to examine and evaluate this important branch of welfare economics.

WHAT IS THE PROBLEM?

The major limitation of benefit-cost analysis, as it has been applied to public investments in the United States, is that it ranks projects and programs in terms only of economic efficiency. (At the national level this

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means that projects and programs are judged by the amount that they increase the national product.) But the objective of most public programs is not simply, not even principally, economic efficiency. The redistribution of income to classes or to regions is an important objective in government plans-witness the Appalachia program. And there are other objectives, too-the promotion of national self-sufficiency, for example.

In other words, the objective functions of most government programs are complex; yet benefit-cost analysis has been adapted to only a single objective-economic efficiency. Thus, benefit-cost analysis may be largely irrelevant, or relevant to only a small part of the problem of evaluating public projects and programs. We should not settle for the current state of benefit-cost analysis, but rather find ways to make it applicable to the real issues of public investment.

Now, in all complex objective functions for government programs, economic efficiency will be one term. A second will frequently be income redistribution, as has been noted-to classes (the poor) or to regions (depressed areas). These two objectives may be complementary in some ways: a program designed to transfer income from the rest of the nation to Appalachia, or from the wealthy to the poor, may also increase national product? But a government program that maximizes efficiency will not necessarily, indeed is not likely to, achieve a specified high level of income redistribution. Thus, a planner who is responsible for developing a program or project for both purposes will need to know the relative weights to assign to efficiency and income redistribution.

Assume that the problem is to design an irrigation project on an Indian reservation so as to increase the income of the Indians as a group and to increase food production for the nation as a whole. The relation between income for the Indians (income redistribution) and food production (national economic efficiency) in this case can be stated in any one of three ways as follows. The example is based on Marglin [ref. 3]:

1) Maximize net income to the Indians, subject to a constraint that the ratio of efficiency benefits to efficiency costs is at least 1.0 to 1.0, or 0.9 to 1.0, or some other.
2) Maximize net benefits from food production in national terms-i.e., economic efficiency-subject to a constraint that the Indians net $X thousand/yr.
3) Maximize a weighted sum of net benefits from economic efficiency

[1] For conditions under which regional redistribution **in** the United States can be achieved without significant loss in economic efficiency, see Mera [ref. 2]. For a more general statement of the relationship between economic efficiency and income distribution, see Marglin's discussion on "Objectives of Water Resource Development: A General Statement" [ref. 3, ch. 2, pp. 63-67].

and income redistribution in which $1 of income to the Indians is valued at $(1 +*X*) of efficiency. (In this case the *X* can be called a shadow premium on redistribution benefits.)

With proper values these three statements will be equivalent. Any constraint can be converted into a shadow price and any shadow price into a constraint.

The efficiency benefits and costs of this two-term objective function can be measured fairly well by the art of benefit-cost analysis in its present state. There are problems, to be sure, resulting from such factors as the collective character of the benefits of many public programs, the need to measure costs in terms of resource displacements rather than market prices where these two measures diverge, the selection of an appropriate discount rate, and various so-called external effects-but great progress has been made on these in recent years.2 Thus, all that is needed to solve the maximization equation is to specify the tradeoff ratio between efficiency and income redistribution. If there is a way of finding this ratio, the maximization problem can be solved in any of its three forms, and we can design projects and programs that are responsive to a realistic two-factor objective function.

There is a way to determine the tradeoff-through the political process. For the federal government my studies indicate that there is a capacity in the legislative process to make the tradeoff decisions that can then govern the design of projects and programs. The President initiates the legislative process; the Congress examines the President's proposals in the light of alternatives and accepts, modifies, or rejects them. Thus, the experts in the executive departments need to develop data that show the effects on the design of programs and projects of different tradeoff ratios. This the executive can do. The President needs to select one or a range of these ratios and thereby initiate formally the legislative process. This the President can do. And finally, the Congress, when presented with such data and such a presidential initiative, needs to and can respond in order, as we shall see.

Ironically but understandably, the field of public investment for which the present benefit-cost technique is most advanced, water resources, is the field for which the political technique for determining tradeoffs among efficiency and other objectives is most primitive. The legislative process for water resources consists principally of omnibus bills that authorize individual projects, rather than of legislation that sets standards and criteria. In the housing and urban renewal area, by contrast, stan-

2 For discussions of these problems as of 1961, see Marglin and Dorfman ([ref. 3] ch. 2, 3, and 4); also see [ref. 4]. For examples of more recent developments, see papers by Peter 0. Steiner and Kenneth J. Arrow, in this volume.

dards and criteria, based on both income redistribution and economic efficiency, are determined in the legislative process, and benefit-cost analysis is primitive.

The problem is to combine the advanced state of the art of efficiency benefit-cost analysis, as found in water resources planning, with an equally sophisticated technique for relating efficiency benefits and costs to those stemming from other objectives.

HAVE BENEFITS BEEN OVERESTIMATED?

In this context it is interesting to examine the arguments over so-called secondary benefits and how they should be included, if at all, in project analyses. There is no such thing as a secondary benefit. A secondary benefit, as the phrase has been used in the benefit-cost literature, is in fact a benefit in support of an objective other than efficiency.3 The word "benefit" (and the word "cost," too) has no meaning by itself, but only in association with an objective; there are efficiency benefits, income redistribution benefits, and others. Thus, if the objective function for a public program involves more than economic efficiency-and it will in most cases-there is no legitimate reason for holding that the efficiency benefits are primary and should be included in the benefit-cost analysis, whereas benefits in support of other objectives are secondary and should be mentioned, if at all, in separate subsidiary paragraphs of the survey report. Using the current language and current standards, most of the benefits to the Indians in the Indian irrigation project are secondary benefits. How silly!

In this context it is interesting also to examine the conclusion of many non-governmental studies of government planning for water resources projects, namely, that benefits have been overestimated. Hubert Marshall has recited the evidences of chronic overestimation in his paper, "Politics and Efficiency in Water Development," elsewhere in this book **The** principal cause of such benefit "overestimation" is, I believe, the unreal restrictions placed on the analysis of projects by the unreal but virtual standard that the relation of efficiency benefits to efficiency costs is the indicator of a project's worth, when in fact the project is conceived and planned for objectives in addition to efficiency. In such an incongruous circumstance one might expect project planners to use a broad definition of efficiency benefits. The critics, either not understanding or unsympa-

3 The term has been used also to describe a small class of efficiency benefits that are *in*duced rather than *pro*duced directly, by public investment, but the usefulness of this distinction is questionable.

thetic to the planners' plight, have judged them by a more rigorous definition of efficiency.[4]

HOW DID WE GET TO WHERE WE ARE?

Why has benefit-cost analysis developed in this way? Certainly not because of any myopia on the part of the Congress, though executive officers are frequently quick to blame Congress for their ills. To be sure, we do not have adequate legislative objectives, standards, or tradeoff ratios for the design and evaluation of water resources projects, but this is because the President has failed to initiate the legislative process, not because of a lack of receptivity to such initiatives by Congress. In fact, certain committees of Congress, impatient with the President for not proposing legislation to set standards, have tried to initiate the legislative process themselves; but without co-operation from the executive they have failed, understandably [ref. 3, p. 588]. The task of assembling and analyzing data, the necessary first step in the legislative process, is beyond the capacity of Congress and its staffs in complex areas like this one. Insofar as there is a general standard for the design of water projects that has been approved by Congress in legislation, it is a thirty-year&old statement that "the benefits to whomsoever they may accrue should exceed the costs.[5] This standard, you will note, does not specify efficiency benefits, but "benefits to whomsoever they may accrue."

The executive agencies have painted themselves into the efficiency box. In 1950 the Subcommittee on Benefits and Costs of the Federal Inter-Agency River Basin Committee gave overwhelming emphasis to the efficiency ranking function in its now well-known "Green Book" report [ref. 5]. In 1952 the Bureau of the Budget, in a Budget Circular that neither required nor invited formal review and approval by the Congress, nailed this emphasis into national policy, adopting it as the standard by which the Bureau would review agency projects to determine their standing in the President's program [ref. 6]. And soon thereafter agency planning manuals were revised, where necessary, to reflect this Budget Circular. In this way benefits to all became virtually restricted to benefits that increase national product.

The federal bureaucrats, it should be noted, were not acting in a vacuum; they were reflecting the doctrines of the new welfare economics

4 Causes for so-called benefit overestimation, with the exception of the cause I consider to be the principal one, are given in Hubert Marshall's paper, in this volume.

5 Incidentally, this provision of the Flood Control Act of 1936 (49 Stat. 1570) did not originate in a presidential initiative.

which has focused entirely on economic efficiency. Non-efficiency considerations have been held to be outside of the domain of the welfare economist. They have been called by such loaded names as "inefficient," "value-laden," "altruistic," "merit-wants," "uneconomical.[6]

WHAT CHANGES IN WELFARE ECONOMICS THEORY ARE NEEDED?

From a practical point of view, the new welfare economics has dealt exclusively with efficiency because for it, and not for other objectives, benefit and cost data are provided automatically by the market, though market prices sometimes have to be doctored. Theoretically, however, the preoccupation of present-day welfare economics (and its branch of benefit-cost analysis) with economic efficiency results from its very basic assumptions, and two of these in my view can and should be abandoned.

First is indifference to the distribution of income generated by a government program or project-the assumption that each dollar of income from the program is of equal social value regardless of who receives it. In benefit-cost analysis that maximizes efficiency, an extra dollar to a Texas oil man is as desirable socially as one to an Arkansas tenant farmer, and an additional dollar of benefits for Appalachia, West Virginia, is no more worthwhile than one for Grosse Pointe, Michigan.

Few welfare economists support the social implications of this basic assumption, and they would compensate for them in one of two ways. Some hold that the professional planners should design projects and programs for economic efficiency, for which benefit-cost analysis can provide the necessary ranking function; and that thereafter these project designs can be doctored and modified by a political process to account for any "uneconomic" objectives.[7] But this response is unsatisfactory for reasons already given. Where government programs are intended for complex objectives they should be designed, where this is possible, for such objectives, not designed for one objective, which may not be the most important, and subsequently modified in an effort to account for others. Almost inevitably economic efficiency will be overweighted in such a scheme. How relevant is this type of planning for our Indian irrigation project? Furthermore, such a planning process calls on political institutions to perform a task for which they are not well equipped.

6 For example, see Musgrave [ref. 7]. The first of these nomers is perhaps correct technically, but even this cannot be said of the others, for efficiency is not necessarily less or more value-laden, altruistic, or meritorious than other objectives:

7 In essence, this is what Dorfman proposes for West Pakistan [ref. 8].

Where the approval and modification of individual projects, rather than a debate on objectives and standards for designing projects in the first place, is the ***principal*** activity of the legislative process, decision making for the nation can disintegrate into project trading. In the legislature, for example, the voices of the whole house and of committees are muted at the expense of those of individual members, each making decisions for projects in his district and accepting reciprocally the decisions of his colleagues. Nor does the executive under these circumstances play a more general or high-minded role. The public investment decision process can be organized, hopefully, to play to the strengths rather than to the weaknesses of political institutions.

An alternative response of some welfare economists to the inequitable social consequences of the basic assumption of indifference to income distribution is as follows: It is more efficient to redistribute income directly from one group of individuals to another through government programs of taxation and subsidies, than to do so indirectly through government investment programs that are designed also to increase national product. If the government's objectives are, for example, to increase both national food production and income of the Indians, it should plan to accomplish these by two programs rather than a single one. Government planners should design the most efficient program for increasing food production, which may mean additional irrigation facilities in the Imperial Valley of California, where there are no Indians. Then, with taxes collected from the irrigators and representing their willingness to pay for their new benefits, the government should make subsidy payments to the Indians. In this way, so goes the argument, the government can achieve the best of both worlds. "Best" in this context means "efficient," however, and there is no reason why a community need prefer the most efficient method for redistributing income, especially if it requires transferring cash from one group to another. As Marglin points out in his treatment of this subject [ref. 3, pp. 17-18, 63-67], the means by which a desired distribution of income is achieved may be of great importance to the community.[8] In our example, the

[8] Tinbergen [ref. 9] observes that in the normal case, *n* programs (or instruments) are required to maximize a welfare function that includes *n* objectives (or targets). But for his normal case Tinbergen assumes that only the results of the programs, not their qualitative characteristics, affect welfare and that planners are free to select that level of achievement of each objective that maximizes the over-all welfare function. This freedom is theirs only if *n* programs are available to the planners. Our discussion, on the other hand, proceeds from the assumptions that the qualitative characteristics of the programs affect welfare, and that the number of acceptable programs may be fewer than the number of objectives, which necessitates the tradeoff among objectives. This would be an abnormal case in Tinbergen's formulation.

community would probably be willing to give up some efficiency to see the living standard of the Indians improved by their own labors rather than by the dole. In short, the community may quite properly want to realize multiple purposes through public investment projects and programs, and if benefit-cost analysis is to be of great use in planning these activities, then the basic assumption of indifference to their distributibe consequences must be abandoned.

It should be noted, however, that where, as in the case of the Indian irrigation project, a government program produces benefits that can be sold or otherwise charged for, a desired redistribution of income can be achieved by both the quantity of benefits produced and the prices charged for them. For any given quantity of irrigation water, the smaller the repayment required from the. Indians, the greater the income they will receive. Thus, when the agency men prepare data showing the effects on public programs of alternative tradeoffs between economic efficiency and income redistribution, these alternatives should include different repayment possibilities.

The second basic assumption of the new welfare economics and of benefit-cost analysis that needs to be challenged is consumers' sovereignty -reliance solely on market-exhibited preferences of individuals. This assumption, to be sure, provides normative significance for the familiar prescriptions of welfare economics on which the efficiency calculus is based-for example, that price ought to equal marginal costs. Nonetheless, it is not relevant to all public investment decisions, for an individual's market preference is a response in terms of what he believes to be good for his own economic interest, not for the community.

Each individual plays a number of roles in his life-social science literature is filled with studies of role differentiation-and each role can lead him to a unique response to a given choice situation. Thus an individual has the capacity to respond in a given case, to formulate his preferences, in several ways, including these two: (1) what he believes to be good for himself-largely his economic self-interest, and (2) what he believes to be good for the political community. The difference between these two can be defined in terms of breadth of view. To the extent that an individual's response is community, rather than privately, oriented, it places greater emphasis on the individual's estimate of the consequences of his choice for the larger community.

Now, the response that an individual gives in any choice situation will depend in significant part on how the question is asked of him, and this means not simply the way a question is worded, but the total environment in which it is put and discussed. This can be illustrated with a small group experiment. Questions with relevance for the church (for example,

should birth control information be provided to married individuals who desire it?) were asked of Catholic students randomly divided into two groups. One group met in a small room where they were made aware of their common religious membership. The other group met in a large auditorium, along with hundreds of other students of many religions, where no effort was made to establish awareness of common religious beliefs. Although all of the students were instructed to respond with their "own personal opinions," there was a significant difference between the replies of the group that were aware of their common religious membership and the unaware group, the former approximating more closely the orthodox Catholic position against birth control [ref. 10].

An individual's response depends, then, on the institutional environment in which the question is asked. Since the relevant response for public investment analysis is community, not privately, oriented, the great challenge for welfare economics is to frame questions in such a way as to elicit from individuals community-oriented answers. The market is an institution designed to elicit privately oriented responses from individuals and to relate these responses to each other. For the federal government, the electoral, legislative, and administrative processes together constitute the institution designed to elicit community-oriented responses. The Maass-Cooper model describes these processes within such a context [ref. 3, p. 588].

Although several welfare economists have recognized explicitly that individuals play several roles and that these roles influence preferences, they go on to say that in making decisions relating to social welfare each individual uses a composite utility function, a total net position representing a balance of all of his roles [ref. 11, 12, 13]. This last hypothesis, which is not supported by experimental evidence, is unfortunate. It misses the point that an individual will respond differently depending on how the question is asked of him, and it fails to give proper emphasis to the differentiation of institutions for putting the question-for example, the market institution to elicit privately oriented responses, and political institutions for those that are community oriented.

Ideally, we want community, not market, responses of individuals with respect to both factors in our complex objective function--economic efficiency and income redistribution. Fortunately, however, market-determined prices are a fairly good surrogate for the economic efficiency factor, providing adjustments are made for so-called externalities and the like.[9] This is opportune. Were it not for the propriety of using market-related prices for efficiency benefits and costs, benefit-cost analysis for

[9] Marglin's 1962 analysis [ref. 3] is one demonstration of this.

public projects and programs would be beyond the capacity of available economic techniques and of political institutions as they operate today.

Some day, I am confident, we shall be able to use institutions that elicit community-oriented responses to measure all factors in a complex objective function-efficiency, income redistribution, and others. The very recent search by a few economists, inspired largely by the work of Kenneth Arrow, for a new criterion of social welfare may contribute to this end.[10] The more modest proposal of this paper is that we use political institutions to measure the tradeoff ratio between a basically market-determined efficiency and the single most important non-efficiency objective of a government program-which is likely to be income redistribution but may be some other.

WHAT IS THE EVIDENCE THAT TRADEOFFS CAN BE DETERMINED?

It remains to be demonstrated that there is a capacity in the legislative process to select tradeoff ratios in a way that will be useful for the design of government programs and projects. As stated earlier, the legislative process involves three steps. First, the officials in the executive departments prepare data showing what would be the effects on programs and projects of alternative tradeoffs between economic efficiency and another objective; second, the President, with these data in hand, selects a tradeoff ratio and proposes it to Congress as the legislative standard; and third, Congress examines the President's proposal, in the light of the alternatives developed in the departments and of others that may come from outside sources, and accepts, rejects, or modifies it.

The first step should not involve great difficulties, especially in water resources where analysis of the efficiency factor is well advanced, although there will be obvious problems in areas where economic efficiency analysis is primitive. For continuing programs, the data necessary to initiate the legislative process need not relate to projects and programs being designed or to be designed; they can be drawn from projects already in operation and in some cases from hypothetical or prototype projects. Agency men can reexamine completed projects and programs and estimate how differently they would have been built and would have operated with different tradeoffs among objectives. At the same time they can reflect in the data that they prepare for new investment programs information generated during previous planning periods, thereby using a sequential planning process. (See Marglin [ref. 14, p. 22].)

10 For an excellent summary of this research, see Rothenberg [ref. 13].

It is at the final, or congressional, stage that doubters will raise most questions, and it is, of course, this stage that is most difficult to prove, because in the water resources area, for which the legislative initiative could be taken most clearly, the President has failed to act. To demonstrate Congress' capacity we must, therefore, turn to public investment programs for which standards have been set in legislation, and these are ones for which benefit-cost analysis is so rudimentary that it is necessary to examine the record very carefully for implicit evidence of a concern for tradeoffs between efficiency and other objectives.

Legislation authorizing the National System of Interstate Highways, principally the Act of 1956, furnishes one example.[11] The legislation provides that the system should consist of 41,000 miles of roads which are identified generally as to location, and it sets design criteria for these roads. The criteria depart from those of earlier highway legislation in three important respects, apart from the taxing methods for financing the federal government's share of the costs. First, roads are to be designed for predicted traffic volumes of 1975, and the monetary authorizations are calculated from this standard.[12] Second, the federal-state matching ratio is changed from 50: 50 to 90: 10. Third, the formula for apportioning funds among the states is changed. The earlier formula for the primary system of roads was one-third on the basis of each of the following ratios: a state's population to the total U.S. population, a state's area to the total U.S. land area, a state's rural delivery and star routes to the total U.S. mileage of such roads. The new formula provides a single ratio the estimated cost of completing the interstate system within the borders of a state to the total estimated cost of completing the entire system by a fixed date, 1972.[13] This last criterion was agreed to after considerable discussion involving numerous alternatives, but principally two: the one adopted and one that would continue to give considerable weight to a state's area and its population.

As Major has shown, these alternatives represent respectively economic efficiency, or more properly a surrogate for efficiency, and income redistribution. Given the requirement of completing a given mileage, by a given date, to a given capacity (1975 traffic volume), an apportionment based on cost of completion would be efficient; and one based on such factors as a state's area would introduce other objectives into the pro-

11 My data are taken from Major [ref. 15]. See this thesis for citations of statutes and reports referred to here.

12 This design standard was amended in 1963 to provide for predicted traffic volumes twenty years from date of approval of project plans.

13 The Act of 1956 contemplated completion by fiscal year 1969, but both estimated costs and year of completion were later amended.

gram, namely, redistribution of income (largely federal construction funds) to rural states where traffic volumes and highway construction costs per mile are typically lower. This is especially true because the alternative provided that if a state received more funds than necessary to complete its portion of the interstate system, it could divert a percentage of the excess for use on its other federally aided roads.

A study of the legislative process in which these new program criteria, especially the third one, were adopted has some useful lessons for our inquiry. There was a vigorous and effective executive initiative of the process. The concept of uniform completion of an interstate system in all states at approximately the same time appears to have been recommended first by a non-federal entity, the American Association of State Highway Officials. Thereafter, the Bureau of Public Roads made a detailed factual study of the costs of building an interstate system. The President, in an address before the 1954 Governors' Conference, proposed that the nation develop a new master plan for highways, and he appointed an Advisory Committee on a National Highway Program, chaired by General Lucius Clay, to prepare one. The Clay Committee used the Bureau of Public Roads report as its empirical base. It recommended the three design standards that were finally adopted, presenting them in the context of alternatives about which debate in the legislative process could and did revolve.[14] Both the BPR and the Clay reports were sent to the Congress, along with a presidential recommendation. The discussion in Congress, in committee and on the floor, was informed and extensive. Information was available on the expected consequences in terms of investment of choosing alternative standards, the participants were aware of the nature of the choices they had to make, and their debate was rich in relevant arguments pro and con on the alternatives, especially on apportionment formulae.

What we have called economic efficiency in this case-i.e., the most efficient way of satisfying a fixed requirement-is of course quite different from economic efficiency as an objective in benefit-cost analysis for water resources, where it means to maximize the contribution of a project to national product. The latter concept played no part in setting the standards for the highway program. The art of efficiency benefit-cost analysis is much less well developed for public investments in highways than in water resources developments, and this was even more true ten years ago than it is today. It is not unreasonable to suggest, from the record of the legislative process for the interstate highway system, that

14 The Clay report's proposals on tax policy and accounting procedures for financing the road system, which we do not discuss here, were altered significantly in the legislative process.

had data been available on real economic efficiency and on alternative tradeoffs between it and income redistribution, these would have been used intelligently in setting standards.

Comparing the legislative processes for the interstate highway system and water resources, the former is less concerned with authorizing individual projects that have been designed and more concerned with setting standards for project design. To be sure, the Highway Act authorized 41,000 miles of roads and fixed their general locations. Design of the roads, including definite locations for them, was left, however, for administrative action insofar as the federal government was concerned.

In federal programs for housing and urban renewal, standards and design criteria have been set in the legislative process, and the recent legislative history of the rent supplement program is an instructive example.[15] In his Housing Message of 1965, President Johnson described a proposed program for rent supplement payments as "the most crucial new instrument in our effort to improve the American city." The federal government was to guarantee to certain private builders the payment of a significant part of the rent for housing units built for occupancy by moderate-income families. These are families with incomes below the level necessary to obtain standard housing at area market prices, but above the level required for admission to publicly owned low-rent housing units. The rent payments were to be the difference between 20 per cent of a family's income (the proportion of income that a moderate-income family is expected to allocate to housing) and the fair market rental of the standard housing to be built. The President proposed an authorization of $200 million over four years which was designed to encourage the construction of 500,000 new housing units in this period. The housing supported in this way would constitute some but not all of the rental units in new housing projects.

The Housing Act of 1961 had also included a program designed specifically for moderate-income families, but this program had encountered certain problems that slowed its expected impact. Section 22 ld(3) of the 1961 Act provided for 100 per cent loans to qualified private builders at below-market interest rates. The low interest rates were to keep rents- within the reach of moderate-income families. The law provided, however, that the interest rate was to be the average rate on all outstanding marketable federal obligations. This was 3 1/8 per cent when the program began, but it had risen to approximately 4 1/8 per cent by

[15] Except where otherwise noted, the facts of this case are derived from legislative documents relating to the Housing and Urban Development Act of 1965 [ref. 16]. David C. Major has assisted in developing the facts and interpretation of this case.

mid-l 965. This meant that rents would be significantly higher and beyond the capacity of most moderate-income families. Another problem with the 1961 program was that the low interest mortgages constituted a heavy drain on the special assistance funds of the Federal National Mortgage Association, the federal housing credit agency that purchased them. Because these mortgages were below market rates, FNMA could not issue against them debentures for sale in private capital markets, and they remained a 100 per cent charge on federal funds. Nonetheless, the Administration recommended in 1965 that the 221d(3) program be continued for four years with a mortgage authorization of $1.5 billion, for about 125,000 new housing units. But this program was to be phased out if the rent supplement proposal worked as its backers hoped that it would.

The Administration had three principal objectives in proposing rent supplements. The first was to increase the number of housing starts. This derived from a desire to expand the national housing stock and a concern about the possibly failing health of the housing industry and the industry's impact on the national economy. We can equate this objective roughly with increasing national product, or economic efficiency. The government's housing experts found that there was a large untapped market for new housing among moderate-income families, and that rent supplements for them would stimulate the rapid construction of substantial amounts of new housing.

The second principal objective of the Administration in recommending a rent supplement program was to give direct assistance to a large group of families with incomes above the public housing level but below the level needed to obtain standard housing at market prices. This objective we can equate with income redistribution-to moderate-income families.

As for direct assistance to low-income families, the Administration bill would authorize additional public housing units. Over a four-year period 140,000 new units were to be built and 100,000 units purchased or leased from private owners and rehabilitated. Using the trickle-down theory, the Administration could claim that all other housing programs that increased the national stock of standard housing would ultimately improve the housing of the poor, but certainly the primary and direct impact of the rent supplement program, insofar as its objective was income redistribution, favored moderate-income families.

The Administration's rent supplement program contained, then, as one design criterion of a tradeoff ratio, relating the objectives of efficiency and income redistribution, and as a second, a specification of the group to be favored by the redistribution. The second criterion was explicit in

the Administration's legislative initiative, though the first was largely implicit.

The Administration's third principal objective for the rent supplement program was "economic integration." Families being aided by the government would live in projects with families who would pay normal market rentals for their housing. In this respect the new program differed from most other federal housing programs for disadvantaged groups, for the latter promoted economic segregation. Only the poor live in public housing; all units in 22 ld(3) projects are for occupancy by designated groups. To encourage economic integration even where local authorities may oppose it, the Administration proposed that in certain cases projects supported by rent supplements need not conform to locally approved "workable programs" for housing development.

After hearings, and debates, and conferences, Congress modified drastically the Administration's design criteria for a rent supplement program. Briefly, the supplements are to be given for new standard housing units that are to be occupied by low-income families. As a result, both the tradeoff ratio between efficiency and income redistribution and the impact of the redistribution itself have been changed.

The relative contributions of the program to increasing national product and to redistributing income have been altered because, with a given authorization or appropriation, there will be fewer housing starts if rents of low, rather than moderate, income families are supplemented. The unit costs of standard housing are the same in either case, but the supplement required to make up the difference between what the family can pay and what is needed to support the new housing varies greatly. The new law authorizes $150 million for rent supplements (rather than the $200 million proposed by the President). According to December 1965 estimates of housing experts, this $150 million would result in 350,000-375,000 housing starts over four years if it were available for the Administration's program of aiding moderate-income families. As rent supplements for low-income families, the same money will induce only 250,000-300,000 starts.[16]

As for the criterion that governs the group to be benefited, the relative impacts on low- and moderate-income families of the original and revised programs for rent supplements and closely related activities are shown in Table 1.

16 Under the Administration bill the rent supplement would be the difference between rent for standard housing and 20 per cent of a moderate-income family's income; under the Act as approved, the difference between the same rent and 25 per cent of a *low*-income family's income. The two changes made by Congress work in opposite directions, but they do not offset each other.

TABLE 1.

Impact on Low- and Moderate-Income Families of Certain Provisions of 1965 Housing Act

Program	Administration proposal	Congressional action
	(All figures are thousands of housing units over four years)	
Low *income*		
Public housing	240	240
Trickle down from all programs that increase national stock of standard housing	ok	ok
Rent supplement program	zero	250-300
Moderate income		
Rent supplements	467–500	zero
221d(3)	125 *(but* problems in achieving this because of high interest rate and drain on FNMA funds)	125 (*and* this likely to be achieved because interest rate fixed at 3% and provision made for tapping private capital)

The impact of Congress' revisions on the Administration's third objective of economic integration is not so clear. Insofar as it is poor rather than moderate-income families who are enabled to live in housing developments along with families that are able to pay normal rents, a more dramatic integration can be achieved. On the other hand, it is clear from the legislative history that Congress does not intend that the housing agency exempt any rent supplement projects from the "workable plan" requirement, which means that local controls will continue.

The housing case study, like that of the highway program, shows that there is a capacity in the legislative process to discuss and adopt Standards and criteria to control the design of public projects and programs; that the Congress is prepared to focus its efforts on such standards and forego authorization of the projects themselves-public works for housing, urban renewal, and community facilities are not individually authorized by law; and that the legislative process for setting standards can be used to select tradeoff ratios where a program has two objectives. On this latter point, the rent supplement case is a bit weak, to be sure. The Administration in its legislative initiative did not make sufficiently explicit the tradeoff between economic efficiency and income redistribution that was involved in its proposal for approximately 500,000 new housing starts for the benefit of moderate-income families. Administration witnesses failed to give a clear statement of how the two objectives were related and how the program would differ if alternative tradeoff ratios were assumed. One reason for this failure is that efficiency benefit-cost analysis has not been perfected for housing programs as it has for

water resources. Nonetheless, the Congress, in reviewing the President's program, managed to focus on the relevant design criteria and, after extensive consideration, including some confused debate, revised them in a way that apparently was consistent with its policy preferences. Also, the executive now has a legislated standard that it can use in redesigning the relevant housing programs. How much better the process would have been if the initiative had been better prepared!

THE LESSON

To those in the executive departments of the U.S. government, the lessons of this article should be clear. If the subject is water resources, initiate a legislative proposal for setting a tradeoff value between economic efficiency and the most important non-efficiency objective that is relevant to your agency's program. Once this is approved, you can forget about secondary benefits, probably be relieved from the drum-drum and profession-wise insulting charges that you persistently overestimate benefits, and you can design projects that are more in accord with the nation's objectives. If the subject is highways, or housing, or most other public investment programs, perfect the efficiency benefit-cost technique for your agency's program. Once this is done, there should be no difficulty in deriving through the legislative process a tradeoff between efficiency and another objective. As a result, the design and selection of projects will be more intelligent and the program should be more convincing to those who judge it.

After the agencies have learned how to work with two-term objective functions, they can try to solve far more complex ones. For the time being, however, purposes other than efficiency and the most important non-efficiency objective will need to be treated descriptively in the familiar "additional paragraphs" of program and project reports.

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Appendix D

"PUBLIC INVESTMENT PLANNING IN THE UNITED STATES: ANALYSIS AND CRITIQUE"

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PUBLIC INVESTMENT PLANNING IN THE UNITED STATES: Analysis and Critique

ARTHUR MAASS

During the New Deal period the United States Government adopted two important techniques--multiple-purpose planning and benefit-cost analysis-for evaluating public investments in natural resources, and the years since then have been devoted to perfecting and applying them. Accomplishments have been substantial, especially in the development of water resources. Thus when in 1963 Robert Dorfman organized the Brookings Institution's first conference on measuring benefits of government investment, he excluded papers on water resources, because the great need was to bring analysis in other areas of public investment up to the level already achieved in the design of water resource systems.[1] At the same time, these techniques, in the process of development, have come to serve ends somewhat different from those that were intended by their early advocates, and, predictably, bureaucratic organizations and professional groups have acquired vested interests in the procedures that have evolved.

The planners of the New Deal were dissatisfied with "the medley of unrelated projects and policies" that then constituted governmental planning and development of water and land resources, and they sought to devise in their place unified policies to control public investments in this sector.[2] Their "guiding principles" for "a sound water policy" emphasized (1) "economic and social justification ... A sound water policy ... will be concerned

1 Robert Dorfman (ed.), *Measuring Benefits of Government Investments* (Washington, D.C.: Brookings Institution, 1965), pp. 8, 9.

2 Their ideas are represented in reports of the National Resources Planning Board and its predecessor agency, the National Resources Committee. See National Resources Commit tee, "Drainage Basin Problems and Programs, 1936," which is Pt. II of *Public Works Planning* (Washington, D.C.: Government Printing Office, 1937); National Resources Committee, *Drainage Basin Problems and Programs, 1937 Revision* (Washington, D.C.: Government Printing Office, 1938); National Resources Planning Board, "National Water Policy," in *Development of Resources and Stabilization of Employment in the U.S.*, Part III, pp. 21–50 (Washington, D.C.: Government Printing Office, 1941). The quotations in this and the following two paragraphs are from pp. 7 and 8 of the 1937 Drainage Basin report, but with minor editorial variations, the same concepts can be found in the 1936 and 1941 reports.

with the promotion of public safety, public health, the public convenience and comfort, the economic welfare of the public, the establishment or maintenance of a high standard of living"; and (2) "integrated control and use of water, within the changing limits of technical feasibility and of economic and social justification."

To implement the principle of integrated control, the planners held that rivers should be developed for multiple rather than single purposes, and that the relevant unit for multipurpose planning and development should be the river basin rather than a single river sector. By "purposes" these planners meant products produced by a public investment, not its economic and social justification-not, as we should say today, its objectives. Thus the purposes of multipurpose planning included such products as flood damage reduction that is provided by levees or by reservoir space which is used to store flood runoff; water supplies for municipal, industrial, and irrigation uses that are provided by storage reservoirs; navigation, sport fisheries, and pollution abatement that are provided by control of low river flows, which are made possible, in turn, by storage reservoirs.

To implement the principle that public investments in the development of resources should have broad economic and social justifications, the planners proposed that a "standardized and modernized" procedure of benefit-cost analysis be developed. This procedure "will take account of social benefits as well as economic benefits, general benefits as well as special benefits, potential benefits as well as existing benefits." In short, "all types of benefits and costs should be evaluated on a consistent and comparable basis."

Thus public investment planning was to be multiobjective, with the aid of the technique of benefit-cost analysis, and multipurpose, with the aid of the technique of multiple-purpose planning. It is a thesis of this article that the first goal, multiobjective planning, has not been realized, in part because of limitations that have been imposed on the use of benefit-cost analysis; and that the second goal, multipurpose planning, has been overdeveloped, in part because the techniques used for this end have been used to compensate for the retarded development of benfit-cost analysis. I shall explore the reasons for this uneven accomplishment, both

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those **owing to the** evolution of the analytical techniques themselves **and** those **that are related to bureaucratic conduct and** to **executive-legislative relations.**

I. Multiple-Purpose Planning

The technique of multipurpose planning has grown over the years into a caricature of itself. Today the quality **of water resource** plans is judged frequently by the extent to which they are comprehensive or multipurpose, by how many of all possible purposes have been included in them. Comprehensiveness in these terms is, of course, a misapplication of the original concept of integrated control and use of water resources, which was not that all purposes that are achievable should be included in all plans, but that all purposes should be considered as eligible to be included so that the ***most important*** ones can be incorporated.[3] Importance in this context is a function of objectives, or the economic and social justification, for public investment in the development of resources; and the technique for measuring the relative importance of investments in different purposes is, presumably, benefit-cost analysis (which we study in the next section of this article).

The present "comprehensiveness rule" has been supported by bureaucratic organization and has evolved in response to it. Agencies with limited rather than general interests in river basin development-the Fish and Wildlife Service, for example-have promoted administrative procedures and in one case legislation that require the principal planning agencies-the Corps of Engineers and the Bureau of Reclamation-to refer to them for review all proposed plans, so that the limited-purpose agencies can determine whether their interests have received proper attention.[4]

3 **Thus, the NRPB report on "National Water Policy" stated: "No matter what the originating purpose of a project** . . . every **other reasonable purpose must be considered adequately in determining its final scope and character if the project plan be sound." National Resources Planning Board, 1941, op. cit., pp. 24, 25.**

4 **For interagency review procedures, see Corps of Engineers' planning manual EM 1120-2-101, Sects. x, xl. For legislation, the Fish and Wildlife Coordination Act, 48 Stat. 401, as amended, 16 USC 661 et seq.**

These review agencies have neither the expertise nor the interest to judge whether a plan represents over-all a good combination for river basin development; their concerns are almost exclusively with their own purposes, and they are likely to give an unfavorable opinion of any report that does not propose a high level of development or protection of these purposes.

Unfavorable opinions by one or more special-purpose agencies do not necessarily kill a river basin plan, but they may do so, and in any case they are likely to prolong consideration and defer approval of plans by higher authorities.[5] To avoid vetoes or delays of their plans, the principal planning agencies have adopted several strategies. One is to revise their reports so as to satisfy special-purpose objectors, even though to do so is, in their view, to reduce the benefits that could be achieved in developing the river. A second strategy of the principal planning agencies is to anticipate objections and willy-nilly to include higher levels of the special purposes in the reports than they would without the threat of review.

Third, the principal planners co-opt the review agencies into the planning process by asking them to prepare reports on their special purposes, which are then included as appendices in the principal agency's report. The planners are not thereby required to accept the proposals in the several appendices, but they are under considerable pressure to do so, for the special-purpose agencies have retained the right to review the final report and to object to it if, in their opinions, it ignores the data and proposals of their appendices.

Finally and most recently, the principal planning agencies have in some cases-as examples, the Susquehanna River and Connecticut River basin reports of the Corps of Engineers-organized coordinating committees that include representatives of special-purpose agencies, to approve the principal report, and in some degree to prepare it. This latest procedure has been added to the others, rather than substituted for them, however. Thus, the special-purpose agencies continue to prepare their appendices, an'd they

[5] Agencies concerned primarily with wildlife and recreation have strong constituencies in the conservation organizations and can mobilize outside support for their comments and recommendations.

appear to have retained the right to review and object to the report that they have helped to make.

Review procedures, therefore, have become a means for insuring that certain purposes are included in development plans, rather than a means for insuring that the purposes are evaluated in the planning process. The promotion by special-purpose agencies of elaborate review procedures as a means for protecting their interests in a program, even when these interests are peripheral to the program, is a familiar form of bureaucratic conduct. Control over communications, by means of a right to review and comment on another agency's proposals, is a technique for acquiring power over the agency without organizational change.

In the case of water resource planning this stratagem got off to a good start in the late 1930s and the 1940s because the principal planning agencies were themselves more interested in developing certain purposes than others-the Corps of Engineers in navigation and flood control, the Bureau of Reclamation in irrigation and electric energy; [6] and because the technique of benefit-cost analysis was developed in those years in a way that restricted the types of benefits and costs that could be counted, so that most of the benefits and costs of some special purposes were of necessity excluded from this important planning calculation. (This latter point will be explained below.) As for the qualifications of the principal planning agencies, these have been changing in the last decade. The Corps of Engineers, for one, is in the process of becoming a genuine multipurpose planning agency; it is prepared to consider all purposes as eligible to be included in river basin plans without preference, and to include in any single plan only those purposes that are the most important. But the Corps is in the anomalous position of being unable to operate in this way because of the present requirements of multiple-purpose planning.7

6 Arthur Maass, *Muddy Waters: The Army Engineers and the Nation's Rivers* (Cambridge, Mass.: Harvard University Press, 1951), pp. 145–207.

7 Recent studies in which the Corps has made or is making special efforts to achieve genuine multipurpose and multiobjective planning include several surveys in the Appalachia region, e.g., Upper Licking River Basin, Kentucky; survey of the Susquehanna River Basin; North Atlantic Framework Study; and the agency-wide Planning-Programming-Budgeting System. See U.S. Water Resources Council, *Conference on Economic Analysis in Comprehensive River Basin Planning, March, 1968* (Washington, D.C.: The Council, 1968), and Department of the Army, Office

At the same time and largely for the same reasons that river basin plans have come to be judged by the extent to which they are comprehensive, the planning process has come to be rated by the quantity of coordination that is practiced, that is, by the extent to which all conceivable interests have been given a voice in planning. Here, as in the case of comprehensiveness, a decision rule, coordination, may have been used to obscure rather than focus on the objectives of public action. In good part to insure full coordination with special interests and with state governments, the

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of the Chief of Engineers, "Water Resources Program Memoranda for PPBS" (1967.8, mimeographed), which is discussed in U.S. 91st Congress, House Committee on Appropriations, *Hearings on Public Works Appropriations for 1970* (Washington, D.C.: Government Printing Office, 1969), Part I, pp. 62-64.

These Corps planning initiatives have resulted in part from efforts to apply to the Corps' planning process the findings, recommendations, and research fallout of the Harvard Water Program, the University of Chicago program in flood plain management, and the studies on alternatives in water management by the National Academy of Sciences-National Research Council. After the Harvard Water Program published its first large report in 1962—*Design of Water-Resource Systems: New Techniques for Relating Economic Objectives, Engineering Analysis, and Governmentat Planning,* by Arthur Maass, Maynard M. Hufschmidt, Robert Dorfman, Harold A. Thomas, Jr., Stephen A. Marglin, and Gordon Mzskew Fair (Cambridge, Mass.: Harvard University Press) -the Corps contracted with this group to study application of its findings to Corps planning. The principal report that resulted from this effort-"The Water Resource Planning Process-Relation to Corps of Engineers Planning," by Maynard Hufschmidt-is an internal Corps document, but several other reports were published subsequent to their submission to the Corps. These include: Maynard M. Hufschmidt and Myron B. Fiering, *Simulation Techniques of Water Resource Systems* (Cambridge, Mass.: Harvard University Press, 1966) ; Myron B. Fiering, *Streamflow Synthesis* (Cambridge, Mass.: Harvard University Press, 1967) ; Arthur Maass, "Bentfit-Cost Analysis: Its Relevance to Public Investment Decisions," *Quarterly Journal of Economics,* LXXX (May 1966), 208–226; Robert Dorfman, "Formal (Mathematical) Models in the Design of Water-Resource Systems," *Journal of Water Resources Research,* I (Third Quarter 1965), 329–336; Robert W. Kates, *Industrial Flood Losses* (University of Chicago Department of Geography Research Paper No. 98, 1965). Although not a report to the Corps of Engineers, a related study of this same research group was Stephen A. Marglin, *Public Investment Criteria* (Cambridge, Mass.: M.I.T. Press, 1967) .

The noteworthy change between 1948 and 1968, for example, in the attitude and policy of the Corps of Engineers is due to several factors, apart from the personalities of Corps' leaders: a decision made in the middle 1950s to cooperate with, rather than oppose, constructive critics in the academic community; increasingly effective control by the Bureau of the Budget over the legislative programs of executive agencies; the Corps' need for broader support due, in addition to the factors above, to the relative decrease in significance of water resources development in the sum of federal programs and to the degrading of Corps' representation at the Cabinet level. With the merger of the Department of the Army into the Defense Establishment, the Corps' principal political representative, the Secretary of the Army, lost cabinet status, and the Secretary of Defense has had little time for, or interest in, the Army's civil functions. The Secretary of the Interior has become more than ever the President's spokesman in water resources matters.

planning process for water resources has only recently been "rationalized" to require, in what has been called "the ideal situation," the following separate planning. steps before construction can begin on a project: (1) National Assessment of Regional Supplies and Requirements, (2) Regional Framework Study-Type 1, (3) Comprehensive, Coordinated, Joint Plan for a Region, (4) Comprehensive River Basin Study-Type 2, (5) Project Studies-Type 3, including several substages of examination, survey, and advanced engineering and design. The Assessment, the Comprehensive Plan, and the Type 1 and Type 2 studies are prepared by river basin commissions or "other Federal interagency-State coordinating organizations" of a region or basin. Type 3 studies are prepared by the principal planning agencies but are subject to all of the special-purpose reviews that have been discussed.

The average estimated time required to complete Type I and Type 2 studies is seven years each, to which must be added in each case one year for "coordinated report review" by the cabinet-level Water Resources Council. Average estimated time to prepare and review Type 3 studies is six years. If these are done seriatim, as in the so-called "ideal" planning procedure, and starting from scratch, that makes 22 years of planning. And according to the Corps of Engineers, this report preparation time "is related primarily to social rather than engineering complexity." The first (1968) annual report of the Pacific Northwest River Basins Commission tells us that the Type 1 Framework Study for the Columbia-North Pacific Region is a joint effort of numerous agencies in the seven Pacific Northwest states and some 22 agencies in nine federal departments. The Commission, whose fifteen members represent the President, nine federal departments or agencies, and five states, has responsibility for coordinating the study. It was started in 1965 and is scheduled to be completed in 197 l, when results will be published in a main report and sixteen appendices, nine of which deal with special purposes such as fish, wildlife, recreation. The search for complete coordination has introduced incredible complications into planning. We can probably move from concept to achievement more quickly today in building a moon station than a single large river dam.[8]

[8] The "ideal" planning procedure is not being realized, of course. Type 3 studies are being made while Types 1 and 2 are under way. Nonetheless, approval of

II. Benefit-Cost Analysis

At the same time that multipurpose planning has been reduced to a burlesque, benefit-cost analysis (hereafter referred to as bca) has been so stunted in its development that it is today a mischievous dwarf when compared to its potential as a technique of analysis.

The Flood Control Act of 1936, the statutory foundation for bca in water resource planning, provided, in language similar to that of the National Resources Planning Board reports, that projects are to be considered feasible economically if "the benefits, to whomsoever they may accrue, are in excess of the estimated costs." [9] However, the words "benefits" and "costs" have no meaning *per* se; they are significant only in relation to particular objectives. Depending on the objectives, a project or program can be designed, and its benefits and costs measured, in terms of increased national income-i.e., economic efficiency benefits and costs; redistribution of national income to certain social and economic classes and regions of a nation and the world; objectives such as national selfsufficiency, national defense, the preservation of wild areas; or any combinations of these. Thus the 1936 provision,

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projects that are recommended in Type 3 studies may well be delayed by the ongoing broader surveys, for those who oppose the recommendations of a Type 3 study will argue that these should not be authorized until they can be considered in the context of the relevant Framework and Comprehensive River Basin surveys. Also, government planners are now considering a procedure whereby the projects that are considered first priority in a Framework study can be planned in greater detail than other proposals in such a study., so that it may be possible to move to Type 3 project planning for them before the relevant Type 2 Comprehensive River Basin studies have been completed. If this procedure is adopted, it will nonetheless require an additional one to one and one-half years after the Framework study is approved to prepare reports suitable for authorization of Type 3 studies. Finally, once the Type 1 and 2 studies are completed for any area, project studies can be made immediately, in an average time of six years.

See U.S. Water Resources Council, *The Nation's Water Resources* (Washington, D.C.: Government Printing Office, 1968), pp. 5–9–8 to 5–9–11; Harry A. Steele, "The National Water Resource Assessment and Regional Framework Plans," *American Journal of Agricultural Economics*, L (December 1968), 1647–1654; Department of the Army, Office of the Chief of Engineers, "Comprehensive River Basin Studies--Study Schedule" (typescript, May 1969), and "Report on Survey Report Procedures to House Committee on Public Works" (offset, April 1966); Pacific Northwest River Basins Commission, *Annual Report for F. Y. 1968* (The Commission, 1969). This last report emphasizes the Comprehensive Plan as apart from Framework and Basin studies.

[9] 49 Stat. 1570.

calling for the measurement of benefits "to whomsoever they may accrue," was not operational. And the executive agencies, working through a succession of interagency committees, have since 1937 sought to give useful meaning to this metric.[10] Their deliberations have had two major results.

First, they have designated a single objective that is to be maximized in bca, namely, national economic efficiency. Bca has become a technique for designing projects that will make the greatest contribution to national income.

Second, and consistent with the first result, the executive agencies have provided that economic efficiency benefits are to be treated as the principal or primary benefits of water programs. The all-important ratio of benefits to costs is calculated in these terms only. Benefits and costs that relate to other objectives are given lip service in planning guides, but in the evaluation of projects and

10 The following list includes for illustration some of the many interagency committees that have been concerned with definitions of benefits and costs and the titles of their principal reports:

1938. Water Resources Committee, National Resources Committee, *Drainage Basin Problems and Programs:* 1937 Revision, pp. 7–10, 68-120.

1941. Subcommittee on National Water Policy, Water Resources Committee, National Resources Planning Board, "National Water Policy," printed as Part 3 of *Development of Resources,* 1941.

1947. Subcommittee on Benefits and Costs, Federal Inter-Agency River Basin Committee, *Qualitative Aspects* of *Benefit-Cost Practice.*

1948. Same, *Measurement Aspects* of *Benefit-Cost Analysis.*

1950. Same, *Proposed Practice* of *Economic Analysis of River Basin Projects* (the so-called "Green Book").

1951. Interagency Water Policy Review Committee, Bureau of the Budget, "Draft Water Resources Policy Act of 1952" and Budget Circular A-47.

1955. Presidential Advisory (Cabinet) Committee on Water Resources Policy, *Water Resources Policy,* especially Section 6: '*Evaluation of Water Resources Projects."

1962. President's Water Resources Council, "Policies, Standards, and Procedures in the Formulation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources."

1968. Economics Committee, U.S. Water Resources Council, *Conference on Economic Analysis in Comprehensive River Basin Planning.*

In addition to the interagency committees, there have been a number of *ad hoc* government committees concerned with this same problem. These include:

1950. President's Water Resources Policy (Cooke) Commission, *A Water Policy* for *the American People.*

1955. Commission on Organization of the Executive Branch of the Government (2nd Hoover Commission), *Water Resources and Power and Task Force Report on Water Resources and Power.*

1961. Panel of Consultants to the Bureau of the Budget, "Standards and Criteria for Formulating and Evaluating Federal Water Resources Development."

programs they are treated as supplementary or secondary to efficiency benefits.[11]

As a consequence of these decisions, programs and projects for water and related land resources have been alone among all government programs and projects in having to justify themselves in terms of a national income objective. Yet the legislative histories of major water statutes-the Reclamation, Flood Control, and Tennessee Valley Acts-like the Planning Board reports of the 1930s, show that executive and legislative policymakers have not been concerned exclusively with national economic efficiency. As a rule the U.S. government has not undertaken investment programs for the purpose of increasing national income alone, nor even for this purpose principally. Redistribution of income to classes or to regions has been one of several other important objectives in government plans, as witness the programs for Appalachia and the Tennessee Valley.

Tension between the implicit if not explicit legislative objectives of water resource development, on the one hand, and the restriction of these brought about by the limitation of benefit-cost analysis to efficiency, on the other, has led to disagreements in the executive and Congress over what are to be considered properly as primary or efficiency benefits. Confronted with an analytical technique that counts efficiency benefits only or largely and with pressure from overseers and auditors in the Budget Bureau, Congressional Committees on Appropriations, and the General Accounting Office to demonstrate that their projects have a benefit-cost ratio greater than unity, those planners who have wanted to emphasize what they believed to be the broader objectives of water programs have tried to sweep into the efficiency category all sorts of benefits that the purist knows are not really efficiency benefits.

This resolution of the uncertainties of 1936 raises several in= teresting questions. Why did the executive agencies paint themselves into the economic efficiency corner? Why have they stayed there? Why has this key policy decision been maintained over the

11 Just as there are no benefits and costs in the abstract, the classes "primary" and "secondary" have no significance except in relation to specific objectives.

The executive agencies have used the phrase "secondary benefits" also to describe a small class of efficiency benefits that are induced, rather than produced directly, by public investments, but we are not concerned with that distinction here.

years by purely executive actions, without any systematic discussion and confirmation in the legislation process?

The most important reasons why the interagency committees initially designated national income as the single objective of bca were these. In government, knowledge of the economics of public investment was primitive in the early years. The professionals were feeling their way, experimenting with microanalytical techniques for public investment that were not well understood. Thus, for example, the now familiar definition of national economic efficiency, as increases in national income or product, came to be understood and accepted by the executive experts as a consequence of their efforts to define the benefits and costs provision of the 1936 Act. Second, the executive experts were much influenced by the analytical techniques of the "new welfare economics" which focused on economic efficiency.[12] Also at the time, in the late New Deal period, considerable attention was being given to construction of public works as a means of fighting the depression, thereby reducing national unemployment and increasing gross national product; and water projects were an important class of public works.[13]

The facts that the executive branch has stayed with its initial decision in favor of national economic efficiency in bca and that the policy implications of this decision have never been examined systematically in the legislative process are owing to different reasons, however-principally to the successful efforts of those who are much concerned about limiting the size of federal expenditures on water projects. Policymakers will be concerned inevitably with the expenditure levels of programs for water resource development, in terms of both fiscal policy and the relative importance of water and other federal programs. But to control expenditures by imposing on the planning agencies criteria that confine the types of benefits that can be used in designing and evaluating projects,

12 On this point see Maass, "Benefit-Cost Analysis: Its Relevance to Public Investment Decision," *op. cit.*, pp. 213–218.

13 The National Resources Committee, in its 1937 Revision of *Drainage Basin Problems and Programs, op. cit.*, said at p. V: "... policies for drainage basin development must be related ... to the business cycle. ... The Committee has previously emphasized and now reiterates the important consideration that both the amount and type of construction and the division of costs among Federal, State and local agencies should vary with the movements of the business cycle."

without considering explicitly the policy implications of these criteria, can mean that a restricted budget is invested in a group of projects that does not fulfill the community's objectives as well as one or more other groups of projects might fulfill them. A procedure which, for the purpose of limiting expenditures, excludes from project design all benefits other than those related to efficiency has the result of foreclosing any real consideration of alternative objective functions.

There are other techniques for determining program levels that do not suffer this disqualification.[14] Nonetheless, some executives, particularly those in the Bureau of the Budget, have defended vigorously the use of an efficiency-oriented criterion for design, although they have not always been explicit that their purpose in doing so is to limit expenditures. To protect the executive against political pressures for raising program levels, these officers have chosen to rely on a control technique that is indirect and, therefore, difficult for opponents to reach and change.

The budget cutters have received support from partisans of two other points of view. Some economists, both in and out of government, believe that the federal government should design and develop water resource systems for the objective of increasing national income, but not for the purpose of redistributing income to the disadvantaged or to underdeveloped regions of the nation. The latter objective can be achieved more efficiently, they believe, by alternative government programs, principally those involving

14 For a systematic treatment of budget constraints in this context, see Stephen A. Marglin, "Economic Factors Affecting System Design," in Maass, *et al.*, *Design of Water-Resource Systems*, *op. cit.*, pp. 159–177.

In a similar manner policymakers who are concerned that expenditure levels for water resources programs may be too high or simply out of control have sought to reduce or control them by raising the discount rate that is used in the design of projects for the purpose of evaluating on a common basis benefits and costs that are realized in different time periods. In general, raising the rate reduces the size and cost of projects and programs, because it tends to discount more heavily the value of benefits, many of which are received in later years of a project's life, than that of costs, which are incurred typically in the early years. But to control expenditures by imposing on the planning agencies a discount rate that is designed for this purpose, rather than for the purpose of reflecting intertemporal comparisons of benefits and costs, is to foreclose policymakers' consideration of these intertemporal comparisons and to invest in a program of projects that in the general case will be less responsive to community objectives than a number of alternative programs.

For a systematic treatment of discount rates in this context, see Marglin, *Public Investment Criteria*, *op. cit.*, pp. 47-69.

direct payments to the groups or areas; and they *prefer* the more efficient means.[15]

Finally, there is a group of experts that has a professional and vested interest in perfecting the technique of bca. When this technique is limited to efficiency, there are nonetheless many difficult problems in applying it to public investments--for example, estimating beneficiaries' willingness to pay where existing market prices are not relevant or where market prices do not exist, accounting for so-called externalities, and defining proper discount rates; and these men want to solve these problems before they are asked to broaden the scope of their analysis to include other types of benefits and costs that may be even more difficult to handle. They do not object necessarily to designing water resource programs and projects for objectives other than efficiency, but they want to limit bca to the efficiency objective. The consequences, however, of their pursuit of perfection in analysis are likely to be the same as those sought by men who would limit the design of projects to gains in national income. This is so because the apparent precision of the ratio of efficiency benefits to costs gives it a dominant weight, compared to descriptive statements about other objectives, in decisions on how to rank and approve projects.

Because they fear that their preference for a predominant reliance on national efficiency benefits may not necessarily be that of the Congress, or alternatively, because they fear that Congress men do not have the capacity to understand the consequences of any actions that they might take on this subject, the experts in the executive who are oriented toward economy and efficiency have sought to avoid legislative activity on the criteria themselves. They have not initiated major legislative proposals on criteria; these have been consummated by purely executive measures. This procedure has had a crucial impact on executive-legislative relations in water policy; and for this reason the next section of this article is devoted to an analysis of the recent history of these relations.

It should be obvious that developments of the two New Deal

15 For an illustration of this view, see Robert Haveman, "Benefit-Cost Analysis: Its Relevance to Public Investment Decisions: Comment"; and for a rebuttal, Arthur Maass, "Reply," *Quarterly Journal of Economics,* LXXX1 November 1967, 695–702.

techniques-multiple-purpose planning and benefit-cost analysis-are related. A limited, efficiency definition of benefits and costs has encouraged those who represent interests that cannot qualify under the definition to evolve alternative means-complex review procedures-to promote or protect these interests. Furthermore, some executives who have supported a restricted definition of benefits in order to hold down expenditures have been sympathetic also to a planning process that, by being complex and lengthy, defers demands on the budget for project construction. Support of national economic efficiency as the metric of bca is for them consistent with support of inefficiency in the planning process, or at a minimum indifference to it-although a limit to the inefficiency that they can tolerate is reached when the costs of planning alone become a significant drain on the budget.[16]

III. Executive-Legislative Relations in Water Policy, 1950 to 1969

In December 1950 the President's Water Resources Policy Commission, an *ad hoc* group of nongovernment experts that had been appointed by President Truman earlier in the year, published a far-reaching report that included proposals for legislation to establish objectives, standards, and criteria for water development programs. This report criticized the evaluation procedures of the executive agencies for excessive reliance on national income benefits and costs and for failure to give sufficient emphasis to other classes of benefits for which the agencies had developed no systematic methods of evaluation. Although the commission proposed that bca continue to be restricted to national income effects, it recommended that the resulting benefit-cost ratio be only part of a formal investment appraisal that was to include also a ranking of nonefficiency benefits and costs along a scale from important to crucial, and an explicit trade-off between this ranking and the efficiency ratio.[17]

[16] Once an initial lag in the planning period is overcome, demands on the budget for project construction can no longer be deferred. But the lag has been getting longer and longer in recent years. See text at note 8.

[17] U.S. President's Water Resources Policy Commission: A *Water Policy for the American People* (Washington, D.C.: Government Printing Office, 1950), Vol. I, pp. 55-6s.

After some delay, the commission's legislative proposals were subjected to an intensive and elaborate review by the Bureau of the Budget, which for this purpose established an Interagency Water Policy Review Committee, and this committee was supported in turn by a galaxy of interagency subcommittees. During the months from November 1951 to February 1952 the interagency committee prepared some 40 position papers on the commission's report. Based on these papers and on other material, the Budget Bureau then undertook to draft a Water Resources Policy Act for submission to Congress, but this task was never completed. The agencies and the Bureau of the Budget failed to reach agreement on many of the act's provisions, and in this situation the Bureau and the White House chose not to develop a leadership position for the President.

With respect to criteria for project design and evaluation, the Budget Bureau did move authoritatively, however. It incorporated in a budget circular, binding on all executive agencies, those criteria that it approved and that in its view could be proclaimed without additional legislative action.[18] Both the decision to substitute an executive action for a legislative proposal and the substance of the standards of the budget circular, which differed significantly in emphasis and detail from those proposed by the Policy Commission, were disapproved by major agencies.[19] Thus, in an environment of agency discord, the Bureau of the Budget was more willing to take executive action that was definitive than to perfect a legislative proposal that would have been subject to further debate in the Congress.

It should be pointed out, however, that the provisions relating to project standards in the Bureau's draft Water Resources Policy Act were so general that *if* the Act had been submitted to and ap-

18 Budget Circular A-47, 31 December 1953. The circular was binding on executive agencies in the sense that it was used by the Bureau to review agency reports, and any deviation from the circular's criteria had to be justified by an agency= David C. Major, "Decision-Making for Public Investment in Water Resources Development in the United States" (Cambridge, Mass.: Harvard Water Program, 1965), chap. 2, reviews the history of Budget Circular A–47 and related documents.

19 The Acting Secretary of the Interior wrote to the Budget Director on 3 September 1952, commenting on the draft budget circular: "I believe that a legislative base is essential to the adoption of new substantive policies in this field. ... I do not consider ... a circular to be a suitable means of establishing policy."

proved by Congress in the draft form, a budget circular similar to the one that was issued could have been promulgated to execute the act. In a memorandum to executive agencies analyzing its draft legislation, the Bureau had said that "restriction of the evaluation section of the bill to general principles is based on the undesirability of crystallizing detailed evaluation standards in legislation at this time." [20] But it was effective legislation action, not crystallization of detailed standards, that was to be avoided; for the latter, as we have seen, was considered to be desirable, where the process could be controlled entirely by the executive branch.

Predictably, some members of Congress, especially but not only those who were unhappy with the substance of the standards of Budget Circular A-47, objected to "the assumption of executive authority over conservation and development policies," and they sought to "reaffirm Congressional control" over this subject. Their efforts peaked in 1955–1956 when the Budget Bureau sent to the executive departments draft revisions of Circular A-47 that, among other provisions, would have required planning agencies to rely even more heavily than before on the single objective of national income in project design and evaluation. These proposed revisions were based in part on the report of an *ad hoc* Cabinet Committee on Water Resources Policy that President Eisenhower had created in 1954.[21] The President had sent the cabinet committee's report to the Congress for its information, but the report's recommendations relating to criteria for project design and evaluation and to certain other subjects were to be effected by executive action.

The House Committee on Interior in 1955 and the Senate Committees on Interior and on Public Works jointly in 1956 held hearings on the draft revised circular; and as a consequence of objections raised in these hearings to both the procedure of execu-

20 Bureau of the Budget, "Section by Section Analysis of Draft Water Resources Policy Act of 1952" (mimeographed, 2 June 1952) , p. 6.

21 U.S. Presidential Advisory Committee on Water Resources Policy (initially Cabinet Committee on Water Resources Policy) , *Water Resources Policy* (Washington, D.C.: Government Printing Office, 22 December 1955). The Budget Bureau participated in the committee's deliberations. At about the same time the Committee on Organization of the Executive Branch of the Government (Second Hoover Commission) issued its *Report on Water Resources and Power* (H. Doc. 84–208) and the report of its Task Force on Water Resources and Power.

tive policymaking and the substance of the policy, the Bureau decided to not issue the revised circular.[22] Further efforts, however, by the Congress, especially the Senate committees, to persuade the executive to propose standards to the legislature for its consideration failed; and the Congressional committees themselves were unable to draft legislation on this complex subject without the aid of an executive initiative, including extensive data from the executive agencies on the engineering and economic effects of alternative standards.[23]

The committees failed also to persuade the executive, as a substitute for initiating legislation on standards, to design projects for two or more alternative objective functions, leaving it to Congress to select the project design that it preferred. They did succeed, however, by means of a Senate Resolution that was adopted in 1958, in persuading the agencies to provide Congress, in each survey report, with a limited amount of data on projects and standards that were alternatives to those that were being recommended in the report.[24] But these additional data were written in attachments to the survey reports, so that they did not limit in a meaningful way the agencies' full reliance on Budget Circular A-47 in designing projects and programs. As a matter of fact, the concepts that had been included in the draft revision of this budget circular, requiring more attention than before to national income in project design and evaluation, came to be practiced in the executive agencies to a significant degree, even though the *Bureau did not formally promulgate them.

Frustrated by the absence of legislative proposals from the executive for water resource development, the Senate in 1959 took the unusual action of establishing a select commission of investigation for the purpose of doing what is ordinarily the executive's work of preparing the early stages of the legislative process.[25] This

22 U.S. 84th Congress, House Committee on Interior, *Hearings on Discussion of Budget Bureau Circular A-47 and the Related Power Partnership Principle* (1955); and Senate Committees on Interior and on Public Works, Joint *Hearings on Conservation and Development of Water Resources* (1956).

23 See legislative documents relating to Senate Resolutions 84-821, 85-148, 85-248, 85-299.

24 S. Res. 85-148; U.S. Army, Corps of Engineers, Manuals — EM 1120-2-117, Application of Senate Resolution 148 (1 January 1959).

25 S. Res. 86-48; S. Rpt. 86-145; 86th Congress, Senate committee on Interior,

committee, which included senior senators from the several legislative committees that have jurisdiction over water matters, was instructed to make studies of "the extent to which water resources activities in the United States are related to the national interest, and the extent and character of water resources activities ... required to provide the quantity and quality of water [needed] between the present time and 1980 ..., to the end that such studies and the recommendations based thereon may be available to the Senate in considering water resources policies for the future." In its report recommending that the select committee be established, the Committee on Interior observed:

> Since 1949, four Presidential commissions and an advisory committee of Cabinet members have made major studies of water resource problems. The reports of these studies have been forwarded to the Congress and they provide much useful information. The reports, however, have not been accompanied by legislative recommendations of the President, and no proposals based on these studies of water resource problems have been transmitted to the Congress in a form that could be considered for legislative action.[26]

In 1959 and 1960 the Senate select committee published in 32 committee prints the results of factual studies that were undertaken at the committee's request by federal and nonfederal agencies. It held 25 days of public hearings in Washington and throughout the country. The main body of the select committee's final report said relatively little that was specific about standards and criteria for project evaluation; but a supplemental statement by four committee members criticized bca for its overemphasis on economic efficiency and proposed new standards to take into account the effects of projects on rates of national growth, on the

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Hearings on S. Res. 48: Development and Coordination of Water Resources; Congressional Record, CV (1959), 6302–6308.

[26] S. Rpt. 86–145, 6, 7.

This Senate action involved, to be sure, criticism of a Republican administration by the Democratic Senate majority; but it involved, also, criticism of the executive by the Congress. The resolution establishing the select committee was adopted in the Senate unanimously with the active support of both the Democratic and the Republican floor leaders.

generation of employment in underdeveloped areas and the distribution of income to them, and on the human values of water resource development that do not produce monetary benefits and revenues. "In short, the standard must relate the particular water resource development to our national destiny in a much more complete way than the mathematical cost-benefits device we are now using." [27]

The select committee made its report ten days after President Kennedy had been inaugurated. Soon thereafter the new Director of the Budget, Mr. David Bell, appointed a Panel of Consultants, who were well-known experts in the field of public investment economics, to formulate standards and criteria for designing and evaluating federal water resource projects and programs. This panel in its report, submitted in June 1961, criticized the excessive, almost exclusive, concern of the existing standards with national income as the objective of water resource development, and it proposed alternative standards and alternative methods of bca that would give greater attention to the other objectives.

As in the case of the 1950 Water Policy Commission, the Budget Bureau was not prepared to accept the proposals of its consultants, nor did it submit the consultants' report to Congress or to the public for their consideration.[28] Instead the report was handed to an interagency Cabinet-level committee which drafted a new statement that was subsequently approved by the President to replace Budget Circular A-47. This 1962 statement of criteria, which is still in effect, gives more attention to nonefficiency objectives than did the budget circular. It is so general a document, however, and so poorly drawn that it requires extensive interpretation and refinement to be operative. And the process of refinement has led to continuing the almost exclusive concern of bca with national income benefits and costs.

The 1962 statement was as much an executive document as Budget Circular A-47 which it replaced; for it was not submitted to

[27] The committee's report is S. Doc. 87–29. The quotation is from pp. 142f.

[28] The report was not printed, to the dismay of its authors, although a limited number of mimeographed copies were made available: Maynard M. Hufschmidt, John Krutilla, and Julius Margolis, with the assistance of Stephen A. Marglin, "Standards and Criteria for Formulating and Evaluating Federal Water Resources Developments" (mimeographed, 30 June 1961)

the legislature for review and approval (although there were informal discussions concerning it between the Executive Office of the President and certain members of Congress).[29] The statement differed from its predecessor, however, in that it was approved by the President rather than by the Bureau of the Budget. The Bureau had lost the capacity to act in its own name, because of the unpopularity that it had earned in Congress with Circular A-47.

On recommendation of the President, this modified procedure for approving standards was subsequently written into law, in the Water Resources Planning Act of 1965. This act gave statutory status to a cabinet-level Water Resources Council that, among other duties, was given authority to establish, with the approval of the President, standards and procedures for the formulation and evaluation of federal water projects.[30] It is interesting to note that Congress in 1965 accepted the administration's proposal that the executive alone establish standards and criteria. Given the history of their frustration over Budget Circular A-47, one might have expected Congress to amend the President's bill and provide for legislative review and approval of these standards. The House, on recommendation of its Committee on Interior, did amend the legislation to require that the council hold public hearings before it established standards. The Senate bill had not contained this provision, and the conference substitute included only a requirement that the council consult with interested parties, both federal and nonfederal. But a requirement for Congressional action on the standards was not discussed in the legislative deliberations. At the time, Congress was satisfied, apparently, with a transfer of for-

29 After it was proclaimed by the President, the statement was transmitted to Congress for its information, for which purpose it was printed as Senate Document 97 of the 87th Congress.

30 Public Law 89-80. The Water Resources Council includes five cabinet officers and the chairman of the Federal Power Commission as members; two cabinet officers are associate members, and the Director of the Budget and the Attorney General participate as observers.

From the point of view of the Budget Bureau, this change may be more nominal than real; for the President will always ask the advice of the Bureau before he approves of any standards that have been proposed by the Council, and the Bureau's views will be especially important when the cabinet council members disagree. Perhaps for this reason the Council has asked the Director of the Budget to participate in its meetings as an official observer.

mal authority to issue standards from the Budget Bureau to a statutory cabinet council and the President.[31]

It would be incorrect to conclude from this evidence, however, that Congress wants to avoid participation in determining standards and criteria for public investments. As we shall see below, a significant portion of the Senate has involved itself recently in the standards work of the Water Resources Council. Also, the year after it passed the Water Resources Planning Act, Congress amended a similar executive proposal so as to require legislative approval of investment criteria. The President's legislation to establish a Department of Transportation provided that the Secretary of Transportation should develop standards and criteria for the economic evaluation of proposals for the investment of federal funds in transportation facilities, and that he promulgate these upon their approval by the President. After considerable deliberation, Congress amended this to require legislative approval of the standards before they are promulgated. Congress also added to the administration bill a section that instructed federal agencies on how to calculate primary direct navigation benefits of water resource projects, thereby overruling a 1964 Budget Bureau standard that had restricted the definition of these benefits, and withdrawing from the Water Resources Council and the President authority to effect standards in this area.[32]

31 See legislative documents relating to Water Resources Planning Act of 1965, especially S. Rpt. 89–68; H. Rpts. 89–169 and 89–603.

32 Some professionals in the executive and in the academic community have said that Congress's definition of benefits in this case is theoretically indefensible; and furthermore that Congress's action proves that the legislature cannot be trusted with the subject matter of objectives and standards. On the first point the critics are no doubt right; the Congressional definition is not consistent with a pure objective of economic efficiency. The disagreement was really over objectives. Those who wanted the broader definition of direct navigational benefits meant that the single objective of national income was not the only component of the objective function of the Government's navigational program.

As for the second part of the criticism, that Congress's action in this case proves that it is not to be trusted with matters of objectives, standards, and criteria, the objectors in the executive have themselves to blame in part. The standard that Congress sought to overrule by its actions had been adopted in 1964 by executive action, with no formal presentation to, and consideration by, Congress. Had the executive initiated a legislative action in that case, the results might have been different in several respects. Having made a legislative proposal, the executive officers would have been in a better position to explain and defend it than they were in defending themselves against a Congressional initiative to overrule a purely executive action. Furthermore, the subject would have been considered by the

The Water Resources Council has only recently turned its attention to standards and criteria, having devoted its early years to organizational matters, including "rationalization" of the planning process, as discussed in the first section of this article.[33] Up to the fall of 1969, the only standard that has been recommended to the President by the Council, and approved by him, is one that raises the discount rate that is used by the planning agencies to compare present and future benefits and costs. As explained previously (see note 14), a principal consequence of such a rate increase is to reduce the size and cost of water resources projects and programs; and it is well known that the Budget Bureau, with this purpose in mind, put pressure on the Council to take the action. The President's Budget Message of January 1968 included raising the water program discount rate as one of several "reforms" proposed for the purpose of reducing the levels of various programs, with the notation that although no immediate savings would be realized from this particular reform, the long term effects could be substantial.[34] Significantly, public announcement in December 1968 that the President had approved the higher rate was made by the Budget Bureau, not the Water Resources Council.[35]

The limiting effects of higher discount rates are especially pronounced when they are used with a technique of analysis that restricts benefits and costs to those related to efficiency or national income gains. Thus, when it became clear that the Water Resources Council would raise the discount rate, those who opposed reductions in water programs, or who opposed this indirect technique for achieving such reductions, began to insist that the Council review all procedures for project evaluation, especially those that restrict the counting of benefits in bca.

The Senate Committee on Interior, reporting in June 1968 a minor bill to revise the authorization of appropriations for ad-

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committees that deal with public works and commerce as part of standards legislation rather than, as was the case, by committees on government operations as part of an organizational proposal to create a new department.

See legislative documents relating to Department of Transportation Act of 1966, P.L. 89670, especially H. Rpt. 894701; S. Rpt. 89–1658; H. Rpt. 89-2236.

33 See pp. 216–217 *supra* and Steele, "The National Water Resource Assessment . . . ," *op. cit.*

34 H. Doc. 90–225, Part I, pp. 19–22.

35 Bureau of the Budget Press Release, 22 December 1968.

ministrative expenses of the Council, said: "The Committee believes that the Council should give attention to all of the criteria utilized in the economic analysis of water resource projects, of which the discount rate is only one part. Of particular concern is the impact of water resource development upon other [than efficiency] economic and social objectives of the nation." [36] In January 1969, after the discount rate order had been issued, fifteen senior Senators, ten Democrats and five Republicans, wrote the Secretary of the Interior, who is chairman of the Council, complaining because public hearings had not been held on the discount order; stating their view that increasing the discount rate cannot be justified without at the same time improving methods of benefit analysis so as to account for nonefficiency benefits; requesting the Council to give priority to developing revised standards for estimating benefits; and urging that regional hearings be held "to insure the full development of all the .. facts necessary to make a responsible determination as to improved methods of computing project benefits." [37]

In response to these and other communications received from many sources, the Council decided to review evaluation procedures. It formed a Special Task Force for this purpose, and held a series of regional and national hearings during 1969. It is too early to tell what the Council and the President will do, but preliminary drafts by the Task Force, now circulating, would make important changes in existing standards, including recognizing multiple objectives and reducing drastically the special preference that has been accorded heretofore to national income gains. Although the proximate cause of these proposed standards was, apparently, public reaction to the increase in the interest rate, their drafting was made possible by recent developments in multiple-objective theory and recent efforts of the Army Corps of Engineers to implement multiple-objective techniques.

As for procedure, the Council intends, apparently, to promulgate the new standards, after the public hearings, and after obtaining the President's approval. It will be interesting to see how the

[36] S. Rpt. 90-1234, p. 3.

[37] The letter of 13 January 1969 has been widely reported, including *Reclamation* News, February 1969, p. 1.

Council handles Congressional liaison in this round of decision-making. The chairman of the Flood Control Subcommittee of the House Committee on Public Works, after criticizing present standards, announced in June 1969 that his group would hold public hearings "on the entire matter of estimation of benefits of water resource development projects with a view toward determining appropriate legislation setting forth the necessary criteria for use by the pertinent federal agencies." [38]

In summary, between 1950 and 1969 the leaders of the executive have not submitted a proposal on objectives and standards to Congress for fear that Congress might butcher their sacred cow of national economic efficiency. But by not doing so they have taken unto themselves responsibility for determining national policy without discussion or effective oversight in the legislative process. When Congressional committees pointed this out, the executive responded, in effect, that the provisions of their circulars were not so much policy objectives as design criteria, and that the Congress would have an opportunity to review how the criteria were being applied when it considered for authorization the individual projects that had been designed in accordance with them.

It is one thing if Congress's major activity in the legislative process is to review and authorize reports on individual projects that have been planned in accordance with the single objective of national economic efficiency, without any way of determining what the recommendations would have been under alternative objectives; and quite another if its major activity is to review and accept, reject, or amend the President's proposals on what should be the objectives for planning projects in the first place. The committees of Congress have wanted more of the latter action; the executive has preferred that Congress concern itself principally with individual projects.

These facts illustrate an aspect of executive-legislative relations that is poorly understood. Emphasizing service to constituents as the role of the individual Member of Congress, many political analysts contrast a project-oriented legislature with a general-interest-oriented executive-the President is, after all, the only

[38] *Congressional Record* (daily ed., 10 June 1969), p. H4659.

elected officer who is accountable to the nation as a single constituency. But this contrast is not necessarily valid.

Constituency service is, to be sure, one role that all legislators play, but they play other roles too-in general legislation, administrative oversight, public education--and each member is free to select the roles that he wants to emphasize.[39] Furthermore, the committee structure and floor procedures of Congress are designed to enable the legislature to play as its principal institutional role that of control over the executive's legislative initiatives and the executive's administrative performance.[40]

In certain situations where the President fails to initiate legislation, Congress can do so. But that is abnormal; in the normal case the President sets the agenda for the legislature. Thus, if Congress is concerned principally with picayune details of programs or with individual small projects, rather than with objectives and criteria for designing a program of projects, it is frequently because these details and projects are what the President has presented to Congress on his initiative. It is popular to speak of the biennial omnibus Rivers and Harbors and Flood Control Act that authorizes individual projects as Congress' porkbarrel bill. It would be more accurate to call it the President's porkbarrel bill, for, with few exceptions, all of the projects in the bill have been either recommended to the Congress by the President or submitted to the Congress with his approval but without recommendation. This has been the form of the President's initiative; and in recent history no President has used his initiating authority to propose that Congress consider standards for a program of water resource projects. Quite the opposite, as we have seen, even though Congress has been receptive to, even insistent on the President's taking the higher road.

Members of Congress as constituency servicemen are interested in securing authorization for water projects in their districts, but they are interested also in program standards, because these stand-

[39] Lewis A. Dexter, "The Job of the Congressman," in Raymond A. Bauer, Ithiel Pool, and Lewis A. Dexter, *American Business and Public Policy* (New York: Atherton, 1963).

[40] For further development of these points, see Maass, "System Design and the Political Process," which is Chapter 15 of Maass, et *al., Design of Water-Resource Systems, op. cit.*

ards determine how their projects will be designed, but also because they have a broader interest in the government's role in public investments for the conservation and development of resources. In this area of government activity, and no doubt in others, the executive, on the other hand, prefers, if it can, to limit Congress to a narrow role of constituency service, in part, perhaps, because the President wants to use projects in return for votes, but principally because professionals in the executive do not trust Congress in matters relating to future demands on the budget. Where the facts and analyses necessary for legislative initiative are complex, as they are in criteria for public investments, the executive stands a good chance of realizing its preference; Congress does not have the capacity to initiate on its own.

IV. Public Investment Planning: Capacity for Change

Is the present state of public investment planning in the United States the natural and inevitable consequence of the play of special interests in our society, or can the relations between multipurpose planning and benefit-cost analysis be molded into different forms? The prevailing fashion in political science would argue the former: that the present state of affairs is the consequence of a natural, partisan, mutual adjustment among the interests, and that this is fine. I do not agree.

An adequate analysis of political institutions in terms of interactions among different groups and their representatives must perform two different, but related, tasks. The first assumes that the preference functions of the participants in decision-making are given, and is concerned with factors that determine the influence of the various participants' interests on the final outcome. This is the so-called bargaining problem, and it has preoccupied political scientists in recent years. This attention has led them to see government institutions principally as facilities for bargaining. It has led. also to a skepticism about reform, for the models that political scientists have used to study bargaining are nominally nonprescriptive. In fact, however, these models have been used widely to defend the present condition. Assuming that the par-

ticipants are willing to live with the results of their bargaining and that there is some minimal freedom for new groups to form and participate, then whatever is is right.

The second task relates to how alternative forms of political institutions affect the preference functions of those involved in decision-making. It does not assume that these preferences are given, as in the bargaining problem, but that institutions themselves influence the preferences. The participants in any situation of choice can respond in several ways—in terms of their individual interests in the narrowest sense, of the sectional interests of their occupational, bureaucratic, or other social groups, of the general interests of society as a whole as they perceive these; and the particular response that they make is determined in part by the structures and processes of government.[41]

According to this analysis government institutions are needed not only to facilitate bargaining, but for the equally important purpose of framing the question so as to elicit the "right," or in our case, community-oriented, response. This half of the study of institutions has been largely neglected by political scientists in recent years, yet it is more likely than the study of bargaining to lead to a consideration of alternative institutions and reforms-to be less complacent. about the *status quo.*

With some confidence I can say that if behavioral, bargaining models had been in style in 192 1, political scientists would then have analyzed-i.e., predicted-that the objectives of the Budget and Accounting Act would not be achieved in any substantial degree; that the agencies would continue to submit their individual budget requests to the Congress, without coordination among them in the executive, since this had been the pattern of successful partisan, mutual adjustments in the past. And in 1936 they would have "analyzed" that single-purpose development of the nation's rivers would never give way to multipurpose development; just as, using bargaining models in the 1960s, some

41 For further development of this point, see Maass, "Benefit-Cost Analysis," *op. cit.*, pp. 215–218. John Harsanyi makes a similar distinction in speaking of "the bargaining problem vs. the problem of dominant loyalties." "Models for the Analysis of Balance of Power in Society," in Ernest Nagel, Patrick Suppees, and Alfred Tarski (eds.), *Logic, Methodology and Philosophy of Science* (Stanford, Calif.: Stanford university Press, 1962), pp. 442 ff.

political scientists have predicted that the planning-programming-budgeting system (PPBS) will fail.[42] All of these cases are similar in certain respects to that of water planning today, and for the first two, surely, and probably for the third, the analysis would have been wrong.

Professor Aaron Wildavsky's popular book on the budgetary process can be used to illustrate this point further.[43] Wildavsky says, first, that the present process-both preparation of the budget in the executive and its review and approval in Congress-is incremental, fragmented, nonprogrammatic, and the result of bargaining in an environment of reciprocal expectations; and, second, that this is as it should be. In part because there are no objective ways of determining which demands are better than others, we need a process that facilitates representation of different interests and resolution of conflicts among them. The present process achieves these ends because it is so fragmented that it enables all interests to be represented, and so incremental and nonprogrammatic that it provides a basis for compromise, for conflict resolution. Proposals to improve the present process by giving more systematic attention to objectives of programs are, therefore, wrongheaded:

> The practice of focusing attention on programs means that policy implications can hardly be avoided. ... Conflict is heightened by the stress on policy differences. ... Logrolling and bargaining are hindered because it is much easier to trade increments conceived in monetary terms than it is to give in on basic policy differences.[44]

Although it contains important insights that had been neglected in scholarly writing on the budgetary process, Wildavsky's description is not fully balanced; the process is not so fragmented and nonprogrammatic as he claims. But the principal criticism to be made

[42] On PPBS see Aaron Wildavsky, "The Political Economy of Efficiency: Cost-Benefit Analysis, Systems Analysis, and Program Budgeting," *Public Administration Review,* XXVI (1966), 292–316.

[43] Aaron Wildavsky, *The Politics of the Budgetary Process* (Boston: Little, Brown, 1964).

[44] *Ibid.*, pp. 137, 138.

here relates to his prescription rather than description, for the former is made without any treatment of the question of the dominant loyalties of the bargaining parties and of how the forms and processes of government influence these loyalties-without, in other words, half of the task of political analysis.

Assuming, then, that relations between multiple-purpose planning and bca can be molded into different forms--that we are not prisoners of the past-1 shall suggest one in which bca is enlarged so that it becomes relevant to a broader range of objectives, while procedures for review and coordination are correspondingly narrowed. I have argued elsewhere that the technique of bca can be expanded to include nonefficiency objectives.[45] The principal problem is not, as so many have claimed, that nonefficiency benefits are intangible, that they cannot be measured. There are metrics or indicators available, and others can be devised, for measuring achievements in terms of redistribution of income, environmental quality, and other objectives.[46] These measures of different objectives cannot simply be added to each other, however. Trade-off or comparison weights are required if programs are to be designed, and benefits and costs evaluated, in terms of multiple objectives. Such weights, when available, tell, for example, how much the nation is. willing to sacrifice in national income in order to achieve a certain level of income redistribution to those who could be served by a program, or in order to achieve a certain level of wildland preservation.

The principal problem of expanding bca is, then, to make the policy decisions that are represented by these weights. These decisions can be made in the legislative process-the President proposing trade-off values, based on analyses made for him by the executive agencies, and the Congress reviewing, amending, approving them. Under this procedure the professionals in the executive would sketch out broadly the alternative engineering and economic consequences of using different trade-off weights in designing a program of projects or a single large project. These

[45] Maass, "Benefit-cost Analysis . . . ," *op. cit.*

[46] See, for example, U.S. Department of Health, Education and Welfare, *Toward a Social Report* (Washington, D.C.: Government Printing Office, 1969), a report on indicators for measuring social change.

alternative consequences would then be compared and debated in a legislative process. After this process resulted in agreement on objectives, the executive agencies would proceed with project planning.

In water policy, trade-off values have not yet been decided in a legislative process. The recent history of executive-Congressional relations in water policy shows, however, that trade-off values could probably be so decided, if the executive initiated their consideration. Executive initiation, it should be noted, is the normal procedure in legislation. Furthermore, recent case studies of federal programs for interstate highways and for rent supplements provide evidence that the legislative process contains considerable capacity to deal with multiobjective functions.[47]

Once a multiobjective design function was determined, the requirements for further coordination would be well defined by that function. The planning process would then become manageable, if the executive were to dismantle the present elaborate review machinery and reconstruct it in accordance with the dictates of a weighted design function. The planning process would be expedited, in other words, if the new form of benefit-cost analysis were substituted for certain stages of coordination; but if the new bca were simply added on top of present procedures, public investment planning would become even more stultifying than already it is.

The partisans of some purposes have vested interests in present procedures, to be sure. For example, the protection of wildlands is promoted, almost invariably, by no development of resources at all, so that the supporters of this and related conservation purposes like a planning process in which they have something approximating a veto on development. They are loath to forfeit this advantage, even though, under the proposed procedures, their purposes would for the first time be evaluated in the all-important benefit-cost analysis, and they would participate in the legislative process that fixed the weights according to which that analysis is made. Such conservationists' objections to multiobjective plan-

[47] On the highway program, see Major, *op. cit.*, chap. 5, and Maass, "Benefit-Cost Analysis ...," *op. cit.*, pp. 219-221. On the rent suplement program, see *ibid.*, pp. 221–225, which was prepared with the assistance of Major.

ning, however-preferring a flat veto to a decision process in which the benefits of their purposes can be compared to those of other objectives-are so blatantly know-nothing in character that they are unlikely t.o stand against a concerted effort to reorganize planning procedures, in which some present institutions and processes may be discarded and others modified and retained for the purpose of debating and reaching agreement on trade-offs among objectives.

Promotion by special-purpose groups of elaborate review procedures as a means for protecting their interests in a program is a form of bureaucratic conduct that we noted earlier. Perhaps this observation should be extended to include the following proposition: Where special interests fare better in an environment of ignorance than in one of enlightenment, they will insist on formal and elaborate procedures for coordination.

Finally, we can ask whether Congressional participation in the setting of design standards would result in a large increase in expenditures on water resource projects, as is feared by many in the executive who are concerned primarily with program expenditure levels, and is desired by others in the executive and Congress who have seen the percentage of the federal budget allocated to water resources decline significantly in recent years.

A decision to design for multiple objectives may or may not result in a larger program of projects. Benefits of different objectives cannot be simply added, nor can their corresponding costs. They must be multiplied by trade-off or comparison weights before they can be combined. The values of these weights determine the size and nature of projects, and it is these values that will be determined in the legislative process, according to our model.

The specific Congressional actions discussed in this article suggest that Congress always wants a bigger program (although one legislative subcommittee during the period of analysis, 1950–1969, proposed that Congress enact standards that would have been more restrictive than Budget Circular A-47).[48] But the evidence is not conclusive on this point; in the absence of a well-prepared execu-

48 U.S. 82nd Congress, House Committee on Public Works, Subcommittee on the Study of Civil Works, *Committee Print 21*, p. 39, and *Committee Print 24*, pp. 52–55. Admittedly this proposal did not gain wide acceptance in either house.

tive initiative, Congress has not had an opportunity to consider trade-off values systematically.

If the trade-off values adopted for multiple objectives do result in the design and authorization of a larger program of projects, this may or may not lead to large increases in appropriations. There is a general relation between the size of authorized programs and the appropriations voted to carry them out, to be sure—larger authorizations result in larger appropriations. But authorizations are frequently not met by appropriations, and in the area of water resources the gap between the two has in recent years grown to be so great that the budget constraint has an independent life of its own. The constraint represents, in other words, one objective of the program, but projects are not designed for it.[49] For fiscal year 1969, the Corps of Engineers has been given approximately $700 million for construction work, and the appropriations required to complete projects under construction at this time are estimated to be approximately $5.4 billion. But there are over 450 active authorized projects that are not yet under construction, and a conservative estimate of their cost is $9.7 billion.[50]

49 If the single objective of today's water resource program were indeed to maximize national income, then we should design all projects so that the last increment added has national income benefits equal to its national income costs, and we should appropriate funds to build all projects so designed — there should be no backlog. We do design projects as if there were no budget constraint, but we do not build all projects. The budget constraint is applied after projects have been designed and authorized, at the time that the executive selects those among all projects that are to be included in the budget. But to combine in this way a national income design objective with a long-term budget constraint, which represents a second, although poorly defined, objective, is inefficient. A limited budget is absorbed by a small number of large projects, each designed to the limits of its contribution to national income. More benefits could be realized from the same budget if the large projects were designed smaller — if the last increments that make the least contribution to national income were not added, in which case additional projects, with greater benefits per unit of expenditure than the last increments of the large ones, could be included in the limited budget.

In other words, where there are multiple objectives, projects should be designed with this fact in mind, and this holds whether the objectives, in addition to the budget constraint, are multiple or simply national income.

50 For appropriations required to complete projects under construction, see *Budget Appendix for Fiscal Year 1970,* H. Doc. 91-16, pp. 349, 353. For estimated cost of projects not yet under construction, see *Hearings on Public Works Appropriations, op. cit.,* Part I, p. 46. These data do not include projects that. have been planned but not authorized, nor those now being planned. The status of the program of the Bureau of Reclamation is similar.

The use of multiple objectives is likely to result in increased expenditures only if the program of projects so designed is considered by the executive and Congress to be more relevant to the nation's needs than is the existing backlog of projects. This might well turn out to be the case.