INTERVIEWEE: DR. IVAN L. BENNETT, JR., Deputy Director, Office of Science and Technology

INTERVIEWER: DAVID McCOMB

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M: To start off, Dr. Bennett, I would like to know something about your background--where were you born and when?

B: Well, I was born in Washington, D. C. on March 4, 1922.

M: And where did you get your college education?

B: I went to college and received an A. B. degree at Emory University in Atlanta, and I thereafter immediately entered medical school and received the M. D. degree in 1946.

M: What was your undergraduate major?

B: As an undergraduate, I majored in philosophy.

M: Then you went into medicine?

B: Yes. I almost had majors in biology and chemistry, so that I was not as humanistic as that sounds.

M: Then you graduated from medical school, and I assume you went into some kind of internship and residency.

B: I interned for fifteen months in internal medicine at Grady Memorial Hospital in Atlanta. I then entered the Navy having been a member of the Naval Reserve during my time in medical school, the majority of which, of course, was during World War II. I was in the Navy for two years, during which time I was stationed at the Naval Medical Research Institute at Bethesda, where I did bacteriological research. In 1949 I went to the Johns Hopkins University and spent one year in post-graduate training in pathology.

This was followed by another year of training in internal medicine at the Duke University Hospital, and in 1951 I returned to Atlanta where I was chief medical resident at Grady Memorial Hospital which is one of Emory University's teaching hospitals. In 1952, having completed my post-graduate training, I accepted an appointment as assistant professor of medicine at Yale University in New Haven. After two years in the Department of Medicine at Yale, I accepted an appointment as associate professor of medicine at the Johnson Hopkins University School of Medicine. In 1957 I was made Professor of Medicine, and in 1958 I became Professor of Pathology and Director of the Department of Pathology at Johns Hopkins from which position I took leave of absence in order to accept my present appointment.

M: Other than your military connection, did you have any connection with the Federal government throughout all this?

B: Well, for a number of years, I have served as a consultant to various agencies in government in several specific capacities to the National Institutes of Health, also as a consultant to the secretary of Health, Education, and Welfare, particularly to Secretary John Gardner. I also at times have served as a consultant to the Surgeon General of the Army. I've been a member of several commissions of the Armed Forces Epidemiology Board, I've been a member of the Board of Scientific Counselors of the Armed Forces Institute of Pathology. I for several years was a consultant to the Army Biological Laboratory at Ft. Detrick and on occasion have served on what I would call ad hoc committees to prepare reports of one type or another for some specific purpose usually relating to biology or medicine, and prior to my present appointment I had worked as a consultant to the Office of Science and Technology and had participated as a member of certain panels that

that were carrying out studies for the President's Science Advisory Committee. So that without trying to detail all these activities, I would say that since I have been in Baltimore at the medical school which is close to Washington that I responded as often as I could to the frequent requests for consultative work.

M: Was the nature of the consulting mainly the area of bacteriology?

B: Well, while my own research through the years has been in the area of infectious diseases, which includes bacterial and viral diseases and so on, I have done consulting work for the government in areas that I would call roughly those of supportive medical education. On one occasion, I helped write a report for HEW that had to do actually with the management of research grants and contracts, and I would say that as the years went on I found myself engaged in the type of consultation that was more of what I would call evaluation of administrative procedures or broad programs rather than based on rather narrow or specific scientific matters. Additionally, for reasons that now escape me I had spent a considerable amount of time with the National Institute for Dental Research as an advisor and indeed at the time that I accepted this full-time appointment in the Federal government, I was chairman of their Board of Scientific Counselors which is a group that regularly advises them on the research they carry out in Bethesda as opposed to the research they support in universities by grants. I've had no dental training, but the type of problems that they face are not specific to dentistry and have to do more with the management of broad programs of research.

M: I see. Just how were you selected for this particular job? You'd been working in consulting some.

B: Well, in early 1966 I was appointed by President Johnson to become a member of his Science Advisory Committee which is a group of individuals who are from outside the government by and large and who meet regularly to develop advice on broad questions that relate to science and technology. The advice is transmitted of course through the chairman of the committee who is the President's special assistant. Sometime in the early part of the summer of 1966, after I had been a member of the President's Science Advisory Committee for just a few months, I was asked if I would accept an appointment as Deputy Director of the Office of Science and Technology.

M: Was it (Donald) Hornig that asked you this?

B: Dr. Hornig did ask me, but the original suggestion was made by my predecessor, Dr. Colin MacLeod, whom I knew personally and had known for a number of years. The suggestion was made by telephone, and it was made at a time when, as I recall it, Dr. Hornig for one reason or other was out of the country. And as soon as Dr. Hornig became available he also telephoned me and I came over and discussed the matter sometime within a few days. Having decided that this would be a worthwhile thing to undertake I then obtained permission from the president of Johns Hopkins, who at that time was Milton Eisenhower and who was rather enthusiastic about my taking such a responsibility in the Federal government (in contrast I might say to the Dean of the Medical School) and who was good enough to grant me a two year academic leave of absence. And it was possible to make appropriate arrangements for my departmental responsibilities in

the medical school to be taken care of. If I could follow that up for just a moment, when we began to calculate after I had been here in the Office of Science and Technology, it turned out that if I had stuck to that two-year leave of absence, that I would have been leaving shortly before the election. And several months before we knew that President Johnson had made the decision not to run again I then went back to the University. In the meantime Mr. Eisenhower had retired and the new President was Dr. Lincoln Gordon, a former assistant secretary of state. I explained to Lincoln Gordon that this would be a rather awkward time to be leaving an Administration and being a very perspicacious man, it took him about two and ahalf minutes to say, "You'd better stay until January no matter what happens in the election." So that I will have been here about two years and three months at the time I leave with the transition of the administration.

M: Did you have any meetings with Lyndon Johnson throughout all of this?

B: During the period of time that this offer was made and I had decided to accept, I dealt really exclusively with Dr. Hornig, and I did not have any direct contact with the President at all.

M: Had you met him at all?

B: I had, of course, met him because he had met with us as members of the President's Science Advisory Committee, so that I had had that contact with him and had had a very brief conversation with him, but it had nothing to do whatsoever with this particular full-time appointment. The decision was made, the appointment was confirmed by the Senate sometime in August, as I recall, and I was sworn in in October without having really discussed it directly with the President, although I had certainly received letters that he had signed concerning the matter.

M: Well, since then, have most of your dealing with the White House gone through Dr. Hornig?

B: The vast majority. There have been, considering the fact that I have been here for two years, relatively few occasions when anything that I have dealt with has made it necessary for me to see the President directly. There have been, I would say, dozens of semi-ceremonial occasions when I have put in an appearance with a group, and there have been perhaps half a dozen occasions when because of the nature of the problem under discussion or the presentation to be made I have talked to him directly and have carried on a conversation with him concerning matters on which for one reason or another I was better informed than Dr. Hornig or where I was taken along because the question might have--the President might ask certain questions that my particular area of expertise would enable me to answer.

M: Do any of these occasions where you had to deal with the President stand out in your mind?

B: Well, I would have to say that when one sees the President intermittently, but not rarely as I have, and when one particularly sees him with a group of individuals that it is almost always an occasion that stands out. He is absolutely superb with a group, and no matter what one expects him to say, he usually tops what has been suggested and puts on a most impressive performance in one sense. But in another sense he, in a very short period of time, I think, can teach a group of individuals more about what the problems are in trying to keep this government running than anyone I've ever seen. I can remember the first occasion that I ever had the opportunity to see him, and it was with the President's Science Advisory

Committee. I would say that in a period of about five minutes that he explained more about his difficulties with the federal budget and his reasons for needing an increase in taxes, what the problem was so far as inflation was concerned, and just how much leeway he had in dealing with the budget, more than I had ever understood before. Since I have been here for two years and have had quite a bit to do with putting budgets together, as I look back on it I am still impressed by how accurate this thumbnail sketch was. And I can also say that most of my colleagues on the President's Science Advisory Committee were very impressed because they are natural scientists. They are not economists or people who have any reason to know very much about fiscal or monetary policy. And in a period of five or ten minutes he put an entirely new set of ideas into their minds about some rather simplistic views they had had about how money is allocated to science or to education and so on and what the real reasons were for the fight that was then brewing and certainly has since erupted between the administration and Congress over expenditures and so forth. It's extraordinary how clear he was in what he had to say and how he illustrated it.

M: When you have made scientific presentations to him, do you feel that he understands what you are talking about?

B: Well, I would like to think that he did because the one that I have made were prepared in such a fashion that we had good reason to believe that they would be understandable to him. I, for reasons that have nothing to do with the fact that I went to Medical school have had occasion to make presentations to him concerning agricultural science particularly in connection with some of the problems of overpopulation and the world food

problem. And in this area, particularly, which is one he obviously is interested in and pointed out that he was interested in, he not only understood but we had a very meaningful, I think, exchange. On that particular occasion I took along some real experts, and they were also impressed by the kinds of questions that he asked them. And he made it pretty clear that he had grasped not only what the overall problem was but that he could understand some of the details. He gave some illustrations from his own experience down at his ranch. It made it quite clear, I think, to all of us that he really knew what we were trying to say, that he was very interested. It was a very heartwarming experience for the group with me because they had done a great deal of very hard work in putting a report together. It was quite clear that their work was appreciated, not just because he thanked them, but because it was clear that he understood and appreciated really what their efforts meant and not simply the fact that there had been a group that had done some hard work.

M: Do you recall how he illustrated this with experiences from the ranch?

B: Yes. In this particular instance we were talking about increasing the world's food supply and pointed out that it was not likely to be done in the rest of the world in the way that we do it in this country, a good illustration being the fact that when you are really interested about enough calories for everyone or enough protein for everyone that one of the most inefficient ways to go about this was to take grain and feed it to cattle because the conversion factor is such that if you just ate the grain, well, I think you understand what I mean. And he immediately actually cited some figures for the conversion rate and pointed out that he didn't really make any money

trying to raise cattle down on his own ranch and that as a matter of fact he lost money on it. He couldn't even afford the fertilizer which they used in the pasture to improve the forage for the cattle. And it was obvious that he did understand that unless you went about it in a very efficient fashion and had a market where individuals were willing to pay a lot for good beef that this was no way to really meet the food needs.

On that same occasion interestingly enough he asked Dr. Hornig--and Dr. Hornig really hadn't been briefed on this at all, he was just along more or less for the ride. He asked Dr. Hornig whether he preferred solid fertilizer or liquid fertilizer. And fortunately Dr. Hornig said, "Well, I prefer liquid fertilizer." And the President said, "Fine, I do, too, and that's what we use down on the ranch." I might say that Dr. Hornig thought it was great that he learned enough at least to give that answer. This boils down to the fact that more and more liquid fertilizer is being used here in the United States because it's an efficient way to transport it. But if one wants to ship it overseas or the way it's manufactured overseas, it's in solid form. Most of us think of fertilizers coming in bags. And the fact is that the President knew all about how to apply it.

As a matter of fact, he got into a discussion with one of the other of the group with us about whether this new machine that is supposed to squirt in at a certain place is really as good as it was cracked up to be. And all in all it was clear that he really did know about farming and agriculture and was very interested. He was not doing this to make polite conversation. I think he was interested and had a group of people there who knew something about it and he was learning also because this is a hobby of his.

Now there have been other instances where, in dealing with quite different matters, on one occasion it had to do with some matters that had come up that were concerned with certain testing procedures related to biological and chemical warfare that it was necessary to go very, very carefully over what the issues were and to answer quite a long series of questions because it's obvious that he is not as good a bacteriologist or virologist as he is an agriculturist. But he certainly remembers what is said and he pays attention, and he keeps asking questions until he understands. In my experience to make sure he understands he then will go over it again if it is really an important issue as this was at the time.

I have also had occasion to discuss certain rather specific health matters with him. As an example, as you probably know there are many different kinds of arthritis, and in a discussion trying to explain that there are some kinds that are serious and some that are not, it didn't take him long to grasp this. So I would say that all in all when it comes to discussing issues that he simply keeps asking questions until he understands and that somehow or other every time that I have dealt with him I've felt that he really understood as well as one can expect a non-scientist to understand.

M: I see. Then you in your capacity have felt no frustration getting your ideas through to the White House and being sure that they are understood?

B: Well, I've never felt any frustration about, let's say, transmitting factual material. I certainly have felt frustration repeatedly in that even though the factual material is understood, my opinion about how these facts should be applied to dealing with what's always a complex situation (has not been.) Let me say that in the beginning it wasn't accepted the way I had thought, in my simplistic fashion when I first came, it might be, and I soon found

that there are many other things that have to go into these decisions. Most of these things we are talking about really represented technical aspects of what was not only a technical problem but which might be an economic, or if you like, diplomatic, or a political problem. And while the final decision may not reflect what let's say the scientists would like to see in the best of all possible worlds, at least I would say this, that I have never felt any frustration over the fact that the technical component or the scientific facts were not taken into consideration or not understood at the time that the President made his decision. Now, I will limit that to the President, because there have been decisions taken at other levels in the White House where I did think that there was a failure to realize that there might be some technical basis for the decision. But that's quite another matter and indeed this office used to spend a fair amount of time trying to correct these ideas that political adviser got that didn't quite fit in to what the technical realities were.

M: I see. Well, then, did you have some trouble getting your ideas to the top?

B: You mean in getting the ideas to the President?

M: Yes.

B: Well, the President doesn't make all the decisions about what emanates from the White House. He couldn't possibly. So that I would say that I never had any real trouble in getting my views to the individual who had the responsibility for the decision. I can remember only two occasions when through the efforts of this office it was not possible to get really important technical or scientific considerations taken into consideration when a political decision was made. These issues were important enough that in

Dr. Hornig's judgment and my judgment it was really necessary to take these questions to the President ourselves. In most instances it was perfectly possible by discussing this with individuals in the agencies or in the executive office or on the White House staff to get these things settled. It's not a matter of neglect of available information, it's a matter of taking decisions without realizing that there is other information.

M: What were the occasions that this happened, when they did not take into account the technical information that you had?

B: I'm sorry, I can't tell you what those occasions were, but they did have to do with decisions that involved the Department of Defense.

M: Incidentally, I meant to tell you this. This tape and the interview can be classified through regular government channels.

B: I don't want to make anything as interesting as this tape inaccessible by referring to matters that are as classified as those particular ones were. The fact that they were highly classified is indicative of the importance we attached to them. That's really all that I'll say about it. I will also say that they were matters that were above and beyond anything that's going on in Vietnam at the present time.

M: Now, in your job here, you apparently have dealt with a variety of problems. Apparently this office cuts across the whole executive branch; you deal with the Department of Defense and Health, Education and Welfare and other areas. Is that correct?

B: Well, that is correct. This office is supposed to develop advice for the President on any matter that involves science and technology, and it is also supposed to, the phrase is, "coordinate the federal effort in science and technology." Now, there are a variety of scientific and technological

programs within the Executive Branch. And indeed, with the possible exception of the Treasury, there are really programs of research in essentially every executive branch--even the Post Office has a large program of research, and the Department of Justice now has an institute that will be devoted to research in the area of law enforcement. This office historically has helped when legislation was passed. For example, when the legislation was passed that enabled Justice to set up this institute, this office worked with people in the Department of Justice to implement the legislation. Indeed we are still working with the man who was selected as director of this institute to help him recruit people, to help him find out what's going on elsewhere in the government. But once this is underway, it will be largely a matter for the Department of Justice.

Now, in contrast to that, let's take what is almost an ultimate in an inter-agency problem and that is the problem of environmental pollution. Essentially every department in the government, again with the possible exception of Treasury and Justice, although they may pollute a little too for all I know, has a concern either because they are polluters or because they are responsible for some phase of pollution abatement. Where one gets into great difficulties is where the national need cuts across the missions of various agencies. One runs into the problem of duplication of effort, and one runs into the problem of bureaucracy in its bad sense in that there is a tendency on the part of certain departments to want the whole program, rather than being willing to share responsibility. Because there is fragmentation in responsibility, some important aspect of the problem may fall between the cracks.

Now, I'll give you an example. The largest user of pesticides in the Federal government is the Department of Defense. The concern of the Department of Agriculture with pesticides, of course, is to use them in such a way that one will increase crop production. The concern of the Interior with pesticides has to do with some of their responsibilities in forest, and also with the fact the pesticides are one component of water pollution. The concern of Health, Education, and Welfare is the effect of pesticides on health. It is not surprising that one finds that these departments are frequently at odds with one another over what should be done. I haven't mentioned the Department of Commerce which, among other things, has an interest in maintaining the pesticide industry as a viable part of our economy. One finds that there may be a desire to set standards; for instance, the Food and Drug Administration might almost put certain food merchants out of business, and would make it almost impossible to raise certain crops profitably. And one finds that at Interior that the voice may go up. You know, "Pesticides are killing our birds and spoiling our recreation areas."

And since there is some truth in all of this, since the public is very interested in this, there is a tendency to be a lot of noise where there may not be really so much to back it up. In these particular areas it becomes necessary either to deal with problems where there is overlap or over-emphasis or to really try to get out the scientific facts that bear on this or make arrangements so that someone will do the research to gather the information that will make it possible to make a proper decision. Air pollution, if anything, is worse than that. You can imagine what the reaction

of the Federal Power Commission or the Interior which is trying to keep the fossil fuel people in business is to a regulation that HEW may set that limits the amounts of sulfur in coal or fuel oil.

M: Well, in this kind of problem, your job would be to advise the President what to do with these departments in their outlook, or what?

B: Let me say that the advice can be given at many different levels than that since problems of this kind can come up from time to time. In the instance of air pollution, the way we dealt with the President was simply to make it known to him that here was an area where there was already some conflict of a jurisdictional type and that there was no reason to think that in the next few years that this was going to be lessened by any individual action. As a result of that, by memorandum to the departments, he indicated that so far as scientific and technological programs in the air pollution field were concerned, he was charging this office to give him advice about what the federal programs should be.

Some of these conflicts are really very severe and they are not purely scientific, but they are based on historic events. And I'll give an example of that in just a moment. The Bureau of the Budget which has to allocate funds for these research and development programs finally arrived at the place that they would not make the allocation in the administration budget until these agencies had cleared the programs with us and had satisfied the Office of Science and Technology. And furthermore once the appropriations were made they would not apportion the funds until the agencies showed us how they would utilize them. This is still in effect although it is getting a little bit better.

But, as an example of the type of conflict that one gets into, you may recall that about three years ago the whole water pollution program which traditionally had been the property of Health, Education, and Welfare was transferred by act of Congress to the Department of Interior. This was a very disrupting experience and it was a loss of a great bureaucratic battle for Health, Education, and Welfare in that one of these very important programs had been lost to them. And it looked like incompetence. They thought Interior had stolen it and so on. Now, it also happens that for many good reasons Interior has a concern with air pollution and while their concern has not been so much to prevent air pollution, they certainly need to be concerned that preventive measures for air pollution take into consideration some of the realities of the economics of the fuel industry in this country.

One of the problems that we still face is how to remove sulfur oxides from stack gases when fossil fuels are burned. The Department of Interior a few years ago, the Bureau of Mines it was, invented a process and patented a process that in a pilot plant, at least, is successful in removing these sulfur oxides and in actually processing it so that one gets either sulfuric acid or elemental sulfur from this. And sulfur is a good thing to sell on the market, the price is going up, it's important in the fertilizer industry. Now, Health, Education, and Welfare went to another country to let a contract with an industry in that country to improve this particular process. The way the Department of Interior found out about this was when the representatives of this company came to them and said, "What is this process that HEW is about to let a contract to have improvement on."

It was quite clear that rather than going directly to Interior who knew more about this at a pilot plant level than anyone else, that HEW was trying to get this done in the private sector. There's no reason why things can't be done in the private sector, but they deliberately did not want to give the appearance that there was expertise in the area of air pollution in Interior simply because they were afraid that there might be a repetition of what happened with water pollution.

There is a constant struggle that waxes and wanes between Interior and HEW because HEW gets most of the funds. Interior has some good ideas not completely across the board in air pollution, but Interior can't get funds directly and HEW is very reluctant to transfer funds over there to support research in their facilities. The main reason for it is not the lack of expertise in Interior, it is HEW's fear that they will lose the whole air pollution program the way they lost water pollution a few years ago. And I might say that this fear has been fanned from time to time by declarations on the part of the Secretary of the Interior that "We should be the department of natural resources; we should preserve the environment." When this happens all of the old bureaucrats in the air pollution program in HEW shrink back and become even less communicative with the Interior. Now, this has improved. One of the reasons it has improved is because HEW has brought in a new group of individuals who don't remember these old feuds and who are willing to cooperate up to a point. But they are still constrained by history and so they remain suspicious. And I might say with good reason because I happen to know that Interior would be delighted if they could snag this whole air pollution thing. I don't think they are going

to get it.

M: So what do you do in a situation like this?

B: Well, in a situation like this, we have a little chat with HEW and a little chat with Interior and they sit down here on neutral grounds and they are reminded that nobody's going to get any money for anything unless we approve it. As a matter of fact what happened as a result of that was HEW did allocate some money to Interior to carry out a program that they had outlined and we had approved. They now have an agreement they've signed between them, and I might say that the minute something like that goes into effect we try to get out of it and stay out of it.

There is a very interesting phenomenon that I was totally unaware of that can result if representatives of two rival agencies like this sit down on the neutral ground that we have here around the White House. That is, that one finds the technical people (the people responsible for these research and development programs), are perfectly willing to cooperate with each other if they can get away with it. And it's easy to get technical agreement. And then all one has to do is write a memo so that the fellow in HEW can say, "Well, we are going to transfer some money to Interior. Well, why the hell are you going to do that? Well, those so-and-sos over in the White House said we have to."

So it turns out that we give them an excuse for doing what they would like to do anyway, and their bureaucrat underlings realize, or think at least, that some irresistible force has been brought to bear. And I could cite dozens of instances where individuals who are caught in this bureaucratic trap (which is by no means peculiar to government) by meeting over

here and by our writing appropriate memos or letters, sort of get a certificate that "I-was-opposed-to-it-but-we-have-to-do-it-anyway" that enables them to get along with the people in their organizations and to go ahead and get the job done. You can clear a lot of air in that fashion. It's perfectly obvious that you don't have to take a question like this to the President. All you have to do is give the people who want to do a good job a chance to do it. I must say that one thing that sticks in my mind is, although I hadn't realized the meaning of it, is what Harry Truman said about his job as being a President. He said he spent most of his time trying to persuade people to do what they knew damn good and well they ought to do anyway. And in a sense much of what we do here is carried out in that fashion.

M: Well, in what you just described, it sounds like this office is in part a lightning rod to drain off friction between departments.

B: Well, yes, and there are instances when it takes more than a memo. Many of these are instances in which nobody really knows what should be done scientifically, and here it is more difficult to divide the job up or reach an agreement. We have a number of inter-agency committees that meet in the office of Science and Technology where there is sort of a continual looking at programs of this type that cut across agencies. Coordination of programs of science and technology really means trying to see to it that those people who are doing similar work within different agencies know that the other groups exist because duplication in and of itself is bad, but competition is not. But you certainly can't compete if you don't know you have competitors. We also try to see to it that where there is duplication

or overlapping in legislative authority, some kind of agreement is reached, so that the job can be done efficiently by either dividing up the responsibilities or by deciding that one agency probably is better able to do a part of the job, in terms of their personnel, equipment and facilities, than the other and getting them to agree. Sometimes it is easy, sometimes it is difficult.

We run into difficulty when we get agreement with the technical people (people running the laboratories), and the policy people in the department won't agree. It is on occasions like that that we may have a series of meetings and some a series of memos. Generally speaking, although sometimes it takes quite a while, one can do this. You have to remember that we are never in a position ourselves in this office to order any operating agency to do something. We work with the Bureau of the Budget, and we borrow on Presidential power. While we rarely do it, there is always the feeling, "Well, you know, these guys could go tell the President," and the President could certainly tell them.

M: You could do this?

B: We could, but as I say, it is very rare that that is necessary. The plain fact of the matter is that agencies don't want to get tangled up with us because of the fact that we do have access to the Bureau of the Budget, because of the fact, I might also say, that we have a very, very good technical staff, so that we are not settling these issues on the basis of guess. I mean, we really have got an analysis of the programs and through the use of literally hundreds of consultants who may be answering technical or scientific questions without any realization of where this is going to fit in to settling an agency dispute. You know, there is a dispute over which is the

best process to use in removing some pollutant from water. We can get that information without any reference in discussing it with our consultants or in talking to industry about why it is that we want it and who it is we are going to clobber over the head with it in a bureaucratic dispute.

M: This brings up another point. The terms "Science" and "Technology" are very broad, and seemingly your office is relatively small.

B: That's correct.

M: Now, is this a problem?

B: Well, our office in common with virtually every office that one could visit in Washington can certainly use a larger staff. On the other hand, we are fortunate in that we have a very large group of consultants, somewhere between 300-500 the last time I looked, that are absolutely the best in the country. And we are able to supplement the staff work that our people do with ad hoc meetings of groups of consultants. For certain problems we have groups that meet regularly, we have committees or panels that look at these programs.

M: Do you have funds to aid in research? If you want to find the answer to a problem, can you contract this out?

B: We could contract it out, and on occasion we have done that. What we are more likely to do, however, since we don't have a large budget, is to persuade the agency where the question is, to use their funds to contract out for a study with the understanding that once that study is done, it may be done by some analytic institution like the Stanford Research Institute. But once that's available that we then will call together a group of our consultants and look that over and see if we agree with it. So in essence they do

much of the work. Most of the agencies have funds for this purpose, and they may contract with the National Academy of Sciences. What we would much prefer to do, rather than undertake a detailed study ourselves, would be for them to have it done and then let us with our consultants look at it and see if we agree with it.

There's another reason for that and that is that most of these studies that are contracted for appear in a form which although rational and let's say scientifically correct does not take into account the structure of the governmental agencies in which these will be introduced. So that we spend a great deal of time trying to translate these into what bureau, what office, what laboratory, is available and what legislative authorities are available, whether the recommendations will require additional legislation before an agency can undertake it, and what this implies in terms of next year's budgetary request in the agency. These are things that one can't expect a group outside the government to make realistic recommendations about because it involves such things as the attitude of the committee that authorizes appropriations for that particular agency and the fact that the agency will tell you, "We'd love to do it but our committee will never let it get through because the chairman is from such and such state and they have this problem, or last year we promised them thus and such." Considerations of this type may be decisive if one wants to get a job done and has to pick an agency to do it.

M: Are you involved with so-called pure research as well as applied research?

B: Oh, yes, indeed.

M: Both?

B: Very much so, and we have two members of our staff who spend the majority of their time in looking at programs to support research in universities. More than half of the pure or basic research that is done in this country is done in universities. It is very hard to take a piece of research and classify it as pure or applied, but in the area of academic science which is research support in universities with federal grant or contract funds and which is supported at the present time by fifteen different agencies, we constantly look at the total budget that is available because you can't look at the budget in any one agency and tell what is available. The granting mechanisms are one of the places that complaints from the universities about excessive red tape, arguments about overhead, arguments about the fact that so and so's grant was not renewed and everyone knows that he is the best scientist there is and this type of thing, may arrive here. And we refer as many of the specific problems as possible to the agencies, but many of them bring up matters of principle.

I'll give you an example of the type of thing that can happen. Dr. Robert Holley who I guess yesterday or day before yesterday received the Nobel Prize for Biochemistry did the work that got him this prize while he was at Cornell University. There have been considerable constraints on taking one's grant from one university to another recently. Dr. Holley lost his research grant from the National Science Foundation because he moved from Cornell to the Salk Institute out in La Jolla. He just lost it because you have to reapply, so that here we were--it's a perfectly good rule, but it happened at a rather awkward time. You've got a man who has just won a Nobel Prize in Biochemistry and the National Science

Foundation has cancelled his grant. They cancel all grants of individuals who change institutions, and he is supposed to reapply. I'm quite sure Dr. Holley will get his grant back when he reapplies, but we made a special effort to see to it that this didn't appear as a headline in the newspapers because this is the type of thing that can be misinterpreted. Dr. Holley understands it, and indeed he didn't complain. He was rather amused by it, and he agreed that this would be a good thing to play down.

M: Well, now, it might be helpful to take a specific case, preferably one that is non-sensitive, and trace it through this office in your interaction with other departments. For example, this problem of world population and food. Is this a good one to do this with?

B: Well, I think we might talk a little bit about population. The food problem is a somewhat of a different problem and gets us into the whole area of why the foreign aid program is as sick as it is, and the food problem is one that will require a great deal more money than Congress is willing to devote at the present time, whereas the population problem is somewhat different. I'd rather talk about that because I think it's one that is particularly germane as a matter of fact to this administration. You may recall--

M: This is one that you have been involved with?

B: I think that it might be pointed out that there has been a very striking change in public attitude about family planning and birth control and so on. It is best illustrated by the fact that President Eisenhower said shortly before he left office, this was something no government had any business dealing with. And, as a matter of fact, during Kennedy's time, he had relatively

little to say about it. But in his State of the Union message in 1965, President Johnson was persuaded, and I might say parenthetically he was persuaded by people in this office at that time, that he should include a sentence about this. The result really, I think, has been amazing. And since that time, of course, the President has spoken about it in very specific terms on numerous occasions including one time at the United Nations. Well, as a result of this--

M: Let me interrupt you here a minute. The genesis of the recognition of the population problem--there's been a lot of talk about population problems going way back, centuries in fact, if you want to go back that far--now, as far as this office is concerned, where does the recognition that this is a problem that the President ought to deal with come in?

B: Well, it came as follows: that we, and when I say "we", I'm now talking about the office because at that time I played a part in this only as a very peripheral consultant in the matter. But the U. S. stance at that time was that if a country requested it, that we would make funds available to them, but that we would make no commodities, as we called them, available. We would make no pills, really no supplies available. And the government was working hand in glove with foundations like the Ford Foundation and the Rockefeller Foundation, trying to persuade them to put money into this, but there were sharp limitations by Congress on what the money that our government put into it could be used for. There were no ground rules that we could lay down if we gave money to a government. We sort of had to wait for a spontaneous request, and there weren't many spontaneous requests because this was not given high priority in many of these countries

when they could request the same funds for a new building or a factory or a dam or something of the sort, so that we had to wait until they came to us.

Mean time, our Agency for International Development was talking to the foundations and the foundations were putting a considerable amount of money in this. But because they had achieved some success in arousing interest since they would not give money in these instances for any thing except programs of populations control or family planning, it soon came to the point that their resources were really over stretched. As considerable as those are, they can't compare to the kind of resources our government has. In the meantime, the fact that the President had mentioned this played a large part in encouraging organizations such as the Population Council, the Ford Foundation, to testify before congressional committees to the importance of solving this problem, and soon members of Congress were announcing themselves as being in favor of this. And over a relatively short period of time it's gotten to be a very, very--I won't say a popular problem, but a very, very important problem in the minds of the public. It's perfectly acceptable dinner table conversation almost anywhere in the country. And I think that in particular because of the fact that it was at approximately that time that the Catholic Church decided to study this, and the Pope called special meetings in Rome. I won't go into what the impact of his decision was, but nevertheless, as you know, whereas this was something that one rarely heard mentioned in public a few years ago, that now it is mentioned all the time.

M: Well, now, the President's statement was a key point here?

B: That was the beginning.

M: And this office persuaded the President to include this?

B: Yes, Dr. MacLeod and Dr. Hornig persuaded him. As a matter of fact, they prepared a suggested paragraph for the State of the Union message which, by the time it came out, consisted of one sentence. And after that, in practically no time, members of the Cabinet and everyone began to talk about this, but until then it just hadn't been mentioned. I think it's very interesting that within the past two years Eisenhower himself has said that he was wrong, and that it is the most important problem that the world faces and so on. Now, consonant with this, despite the fact that Congress was chopping the foreign aid budget every year, last year they earmarked 30 million dollars to be spent only on population programs, and this year's budget had $50 million dollars earmarked for that. Well, now, this is interesting because it does mean they recognize the importance of this, but at the same time the fact that they earmarked funds in a diminishing budget places great difficulty on the people in A. I. D. because if they had more flexibility they could put some funds for other things along with these population funds. They're really more persuasive in the countries where they are working so that although much more money is available, I think that there might be a better way to make it available so that A. I. D. could use the money a little more flexibly. To earmark $30 million dollars all of a sudden when they had been spending about $1. 2 million or $3 million put them in a position where they had to go to practically every country they had been dealing with and say, "Look, we got this population money, so how about taking some of it." That really isn't the kind of approach

that you want to make according to what they tell me and from my own limited experience. So that I think the success of this is going to be dependent in the long run on making available additional funds for economic assistance, because if the budget drops much more and if they expand the amount for population much more, it is just going to be population assistance and these countries want more than that.

At the same time, this year the President appointed a special committee to advise him on programs of population research, both in this country and our foreign program--the committee, which has been meeting in recent weeks, is chaired by Mr. John D. Rockefeller, III, and by Secretary Wilbur Cohen of HEW. I might say that here again the structuring of this committee, the staff work for that and so on, was done in this office, and then through Mr. Cater who was the special assistant for Health, and Education, and recently resigned. I worked with him and it was presented to the President. He said he thought it was a good idea, and that committee will be making its report sometime this month. And it really recommends a five-year program, both for implementation of family planning programs in this country for the disadvantaged, for an increased allocation for research in this area, the development of contraceptive methods, and social science research in terms of demography, in terms of the distribution of population here and throughout the rest of the world, and in terms of what our overseas program should be keyed to during the next five years. The President has given every indication that he will do all he can to implement this. What they recommend requires no legislation, and and as a matter of fact although this report hasn't been officially received

and released, its contents are well enough known that everything possible has been done in this administration budget to begin to implement the program.

M: On this particular problem, then, on population, the office has succeeded in gaining great publicity, and interest throughout the country and has succeeded in getting funds allocated.

B: Well, let me put it this way. See, the interest was there. The Ford Foundation and the Population Council have been trying to get this done for a long time. There's a Population Crisis Committee, but until the President said, "this is something the government is going to deal with," it fell on deaf ears. Since then, the situation has changed completely, and Congress listens, and then it is not just a matter of pouring a lot of money into it. You have to decide what you are going to do with the money. It's one thing for somebody in the Ford Foundation to say, "The United States Government ought to be spending $100 million dollars a year on this program." And it's another thing to say, "Well, all right, that's fine, but what should they spend it on?" Should we start out with a $100 million or should we work up to that and so on? In the development of programs where public funds can be usefully employed at a time when public funds are getting hard to come by, I would say this office and this committee (the idea for which originated this office) have really made a contribution. The fact of the matter is that if you are spending practically nothing in an area like this, you can't spend a $100 dollars in the first year usefully. It takes a while to get geared up so that you have the personnel and you have the institutions to use this money properly. I think we educated some

of the people on the outside to the fact that we have to do this gradually just because there is only so much you can do because of the amount of expetise and personnel that you have. And plus the fact that you have to have some ideas, too.

M: Right. Well now, in regard to population, you've got some interest going, you've got some money. Is it going to solve the problem?

B: Well, let me put it this way. I'm confident that the means will be made available to solve the problem. And so that I would say that it is a problem that can be solved. And whether it is a problem that will be solved is quite another matter. In that, like many social problems, and this is a social problem, with a scientific component--how the large number of individuals who have to be persuaded to take individual actions, since this is an individual matter can be persuaded to do that, is a question the answer to which is not fully known. And I can't say that things have reached the point that any government in the world is willing to pass a law that--there are criminal penalties if you have more children than you are supposed to have. But at least the means will be available that will enable individuals who make this decision to do that. It, like many other problems that I at least and many others tend to look at as being a rather simple affair when I read about it in Good Housekeeping and so on, when one gets into it, turns out to be exceedingly complicated.

It probably above all other problems is complicated by the nature of what it is you are trying to control and the fact that no one has yet looked at a lot of the political matters that influence this. I'll give you an example.

As long as we have a law that means that for every child you have you can deduct $600 from your income tax, you can hardly look upon this as an incentive to have a big family, but it's certainly not a disincentive. So that others have said, "if you have to add $600"--well, this is the type of thing that has been given serious consideration and there have been some very good studies of this. As long as we've got a program of aid to dependent children so that people who are in lower income and disadvantaged groups have children it means they have more income. It's hard for me to believe that in many instances that they deliberately had children to get more income. On the other hand, it does not impose the economic burden on them that it would if they got less welfare aid for each child they had.

I'm certainly not here to suggest that this is what should be done because obviously one has to think of the children also, and you would penalize the children more than the parents. But there are these anomalies that are built into our entire social and political system because we like children. We right now are trying to mount programs that will make sure that children get medical care no matter how much money their parents have, so that anything you do to lighten the economic burden of having children, even though you are doing it for the benefit of the children already born, in a sense means that there is less of a tendency on the part of people to limit their families. So that's an area in which the social sciences are just beginning to take a look and to try to find out about. It's a very interesting question--what is it that makes people decide to limit their families? And if you begin to look around, you find that the people with the most money are the ones that have a tendency to limit their families.

Now, whether this is because they appreciate what children mean economically or how much it costs to send them through school and college, I don't know.

But there isn't any simple demonstration that the thing that makes people decide to limit their families is purely an economic decision, although generally most people feel that this is true. And yet if you look at the disadvantaged where there is a tendency for there to be a large families, it is not the limiting factor there. Until we understand more about why people make this decision, and of course we tend to think it's a much simpler matter in a place like India where obviously they have all these children because they like to have a lot of sons to work out in the rice paddies. But when you get to India and begin to take a look at it, it turns out that it's not as simple as that either. They do want at least one son, but they certainly don't need them to work in the rice paddies.

M: Well, now, what is your office going to do about something like that? Certainly you have expertise in science and technical matters, you know about contraceptives, what do you do about social matters?

B: Well, I'll just say that in the individuals that we have gotten together and on this committee that I've mentioned to you, there are a number of individuals who are demographers and sociologists and who have begun to look at this problem. What we have done is to set up a center for population research in the Institute for Child Health and Development out at the National Institute of Health. Very traditionally, they would have supported the biomedical part of this, you know, research on reproductive

physiology, on contraceptive devices, drugs with possible contraceptive effect, etc. It would have been purely a biomedical program, but they now have authority to support sociological and demographic studies so that it will be, if you will pardon the expression, a multidisciplinary approach. Now this is quite in accordance with the fact that in several universities in this country there were centers for population research that combine the biomedical, demographic, and the sociological approach. There are others that are more demographic, there are others that are more biomedical, but they can all turn to this place for the funds they need as long as their approach is not too narrow and is somewhat comprehensive. So these people are getting together and they are being brought together because they are being funded from a common source and because this is what this program will encourage.

M: It would seem that the nature of problems like this would force an expansion of your office.

B: No, because once this mechanism is set into being--it did require what I call an ad hoc effort of a considerable amount, over a period of several weeks and then some more intermittent work over a period of some months. But once this mechanism is set up, if it is set up properly, all we need to do is wait until we get a complaint or take a look at it every now and then. I guess what we try to do is invent a way that you could get a self-sustaining mechanism for accomplishing a task. And what we like to do, although we never will, is to sort of put ourselves out of business, because if we come up with the right solution, we shouldn't have to worry about it.

M: In a sense, then, you are serving as a catalyst on these problems.

B: Yes, and not just insofar as the purely scientific content is concerned because we are concerned with, let's say, policy, government policy for science (how do we fund scientific research), but also we are concerned just as much with science and technology in policy. And all real social problems that are multidisciplinary. And unless you can have the lawyers, unless you can have the tax experts and demographers talking to the engineers and the medical people and so on, and the education people, so that they really know what to expect from each other; and unless this all can be done in the context that enables you to get the legislative authority, to convince Congress, to get money in the budget, and to select an agency to administer it--if you fall down on any one of those places, you just are not going to get the job done.

Now, so far as science and technology in policy are concerned, let me just give you an example of wherein a decision that is primarily political it is very important that the technical aspects are made clear. This is the decision that was made even before Dr. Hornig got here, but it has to do with the ban on nuclear testing. And before the political decision could be made that the United States could enter into these negotiations, it was very important that the people who made the political decision and for the President to understand what was possible technically in terms of detecting these. That meant we had to get the seismologists, the earthquake people, so that it would be laid out in the most exact terms what the detection possibilities were for violation. Now, those are not the things that made the political decision. There are many other things that went into it, but it was very important that before that was made, that it be known what the limits and what might be expected in the next few years in terms of these

technological developments. In terms of the non-proliferation treaty, similarly it was necessary to know how easy it is to bootleg plutonium and this type of thing. And these are technical facts that must be known because you don't want to enter into a treaty that can be violated when there is no way to check on it.

I just take those two examples from the area of nuclear weapons, as a place where primarily political decisions should be, and in both these instances, were taken on the basis of very painstaking outline to the diplomats and the statesmen and politicians of what this involved technically and what we could do and couldn't do.

M: Now, in the two years that you have been here, has this office changed to any great extent?

B: That's a very difficult question to answer. I'm sure that it has changed. It's changed in that it has had a couple of new responsibilities assigned to it, but these were things that were in the mill by the time I got here. And I suppose that the most striking change of all has been, in my understanding of what the office is for, and in my understanding of how the government works or at least how the government works in this administration. So it's hard for me to evaluate that. I think that because there have been additional tasks assigned by the President that inevitably the office will have to change and that it will have to be expanded and perhaps structured a little more than it is now structured. But since it is primarily intended to advise the President and to help coordinate the implementation of the administration's policies in the government and since from all I can read and all I've been told, Presidents have different styles, I would say that the way the

President uses the office would be dependent upon his style. I can well imagine that the next administration might expand the office, might leave it the same size, or conceivably it could contract the office if it used other mechanisms to accomplish the same purpose.

There is a strong tendency on the part of the Congress I might say, and this is from my direct experience, to assign operating responsibilities to this office. Congress would like to get everything coordinated and have somebody tell the agencies that you must do it this way and so forth. It is just as impossible to run everything in this country from Washington as it is to run all the programs of science and technology in the federal government from this office. It's just out of the question. So that we spend, or have spent, a great deal of time trying to explain to various committees in Congress, (there are a lot of committees that have to deal with programs that have some science or technology in them) why it is that we can't sit here and pull strings and run the AEC the way they would like to see it and run all the programs, in the Department of Defense the way they would like to see them, and so on. We've got a decentralized system and what we are trying to do is make it work. Just as you well know, we are trying to decentralize authority so that the states can use federal money with a little more flexibility because we've learned that you can't run programs in all 50 states from Washington. This is really in the long run what this office will continually try to do. The reason for expanding, though, will be that there inevitably will be an expansion of scientific and technological activity within the government and it won't be because we are trying to exercise more control or coordination, it's because there

is more to control and to coordinate.

M: Well, are you satisfied with the way this office is now structured?

B: No.

M: What would yo do to change it?

B: Well, I really can't answer that. The reason I'm not satisfied is because we have met with as many failures as we have successes for there are many problems that we are going to pass on to the next administration. I would say that the first thing that I would do would be to add a few more people to the staff. And if I had any criticism to make of this administration (and I can make it because I know it's not always the way that Presidents have operated), I think that President Johnson has leaned over backwards in certain instances not to tell the members of his Cabinet what they should do despite the fact that he has no hesitation to sort of lay down the law. We find that if we want to get an agreement between departments or we would like to have the President send out a memorandum giving an instruction, let's say to the Secretary of HEW or Secretary of Interior, it is necessary to get them to agree with the wording first and if they don't want to agree they are just not going to agree. Therefore, no memo goes out. I can understand why it is that in trying to run something as large as this government you have to give the heads of your agencies some latitude, but it does mean that it becomes quite difficult where there is something that the President really could settle with one word and yet you can't get them to agree gracefully to accept this instruction.

And since so many of these things involve what I would call marginal efficiencies, they are not international problems that will interfere with

peace or anything like that, they are in context and in proportion they are trivial, but there are literally hundreds of them. Unless one has a mechanism that enables you to clear these up, then in total they amount to a considerable bit. But it's not the sort of thing where you are going to go sit down and spend an hour with the President talking about because they are just not that important in terms of budget or in terms of their impact on the national economy. I think if there were some way in which the members of the Cabinet who have to depend on their staffs in their departments to do what they are told and they are not technical people, (most of the Cabinet members) they could be brought to heel occasionally. We can't bring members of the Cabinet in this office very often. We have done it to a limited degree, but even they don't have time to deal with most of the kind of issues I'm talking about that our staff may identify that might save a million and a half dollars a year. Well, that's a big budget that we are consuming each year, and there's only so much effort that can go into this. Now, I don't mean I don't think a million and a half dollars saved is important, but it's also hard to prove that any action is going to save money in this government, and so these things just go on and on and on. I do think that there should be some mechanism whereby one could deal more directly and more authoritatively with these smaller things.

M: Would (you agree to) the idea of a cabinet or a departmental office, or say a department of science and technology on a cabinet level. Does this make sense? Or is that going too far?

B: Well, I think that that would settle certain issues. Dr. Hornig is always talking about what he calls the law of minimum interfaces and so that the more often one can get a majority of a given program into one agency the

less often one has to worry about these inter-agency squabbles. See, we don't have many squabbles over health programs. The last one we had was a political one where there was some talk about Cohen being the President's chief health advisor and DOD rose up and said, "He's not going to advise us." And of course the American Legion and all the people from the VA said, "You're encroaching on us." But by and large, let's say in terms of health research, we don't have much trouble with that in terms of inter-agency disputes because so much of is the National Institutes of Health which is in one agency and which is one part of the budget that we just don't have difficulties. And so what we would like to do as new programs are created, insofar as possible is put, let's say 80 percent of it, in the proper department and the other 20 percent then won't be very bothersome.

The things that are really troublesome are problems that come to the forefront such as this pollution problem where there were already--well, let me give you an example. Let's talk about noise as a pollutant. This office just issued a report which surveyed the existing programs in the government. There are eleven agencies who have programs doing research or implementing action programs on one or another aspect of this and they are doing it very legitimately under existing legislative authority. This report simply suggested that they stick to their guns and that none of them try to suddenly become the leading agency for noise. They've all got authority to do this under legislation, and the President simply accepted the report. I might say this report was agreed to by all the agencies. The budget is so short now that none of them wants to

get stuck having to spend its money on a broad noise program and the President accepted the report and told the agencies he expected them to abide by this. So they are all happy now. Now, when money becomes plentiful, one of them is going to say, "we should be the lead agency in noise" and there will be trouble again. But as long as there isn't much money so that they can't do this in order to get a bulge in the budget it's relatively easy.

The thing I wanted to emphasize, though, is that there are eleven agencies, each of which has a perfectly legitimate claim and has some expertise on some aspect of this, and you wouldn't expect that the agency that is concerned with traffic noise in cities would necessarily be the one that should deal with the noise from jet airplane engines, and you wouldn't expect that either of those would necessarily be the one that should have some responsibility for doing some development on how you soundproof buildings. And they are not the same, and we're not about, I think, to have a Cabinet level department of noise. But the people who are going to do work on insulating are the ones that have done other work on building and it obviously is the place to do it. That's very different from designing jet engines. So that I think this is not something that came out of the blue, this was in existence, but has become quite important because of public interest.

These are the things where there isn't any way to put 80 percent of this in one agency without starting about ten jurisdictional disputes. The way we manage that is to have an inter-agency committee on noise that meets perhaps every two months here. Well, they meet oftener than that.

It has gotten to be almost a luncheon club where the people responsible for these programs get together and exchange views. And on that basis, the fact that technical people, you know, admire other technical people who know what needs to be done and so forth. I don't think that this is going to become a great problem in the future unless some future secretary of Interior or HEW decides that he has to give a speech, and his speech writer slips him something saying that the noise problem has been neglected, our department will take it over and prevent deafness among the children and so forth. That's the way one of these things get started. And when that happens, the committee will meet again, ten of the agencies will be shaking in their boots and say, "What did that mean?" And the guy from the agency where it happened says, "Don't worry. We couldn't possibly include it in our budget; he just had to give a speech."

M: Well, we've covered a wide range of questions. I'm going to give you an open-ended one, now. Is there anything else that you would like to comment on? Or anything we should touch on that I haven't brought up?

B: I don't think so. I would like to say, I think, just one thing, and it has very little to do with science and technology. I think the thing I have been impressed with most, and you have to realize that I am a biomedical scientist who has spent essentially all of my time in universities and in medical schools. I'm very impressed with what a hard job the President of the United States has. When I say that, I mean it honestly, because when I think of the simplistic way in which I used to consult over here without having any idea of how complicated and how large this government is. I really seriously wonder if as government expands, which it inevitably

will, if it is going to be possible for an individual to survive for more than one term as President of the United States, either because it simply wears him out or because he is so exposed to publicity all the time. I have been very impressed that if anything goes right someone else gets the credit and if anything goes wrong he takes the blame. And I just wonder if this pattern of four years and then re-election is not likely to change in the sense that it's just such a hard job and so thankless that once is going to be enough.

And I'll be very interested from a purely political point of view to see whether this pattern develops. I think that the social problems that this country faces are problems to which no one really knows the answer. If you accept one group's advice you immediately incur the wrath of another group. So often the difficulty is not a real one in the substantive sense, the difficulty is simply the reaction that certain individuals have to an action that is taken. And I would have to say that I'm not a great personal admirer of the President. I have very great respect for his ability and very great respect for what he had done, but I really am impressed by the fact that anybody who is President of this country needs all the help he can get. Too much of the time people are pointing to problems that exist and not suggesting answers.

One of the things that I learned in this office is that the last thing that the President needs is to be told, "Look, you know, this country has a problem." What he needs to be told is, "Look, as you know, this problem exists and here are some possible solutions to it that we should consider." This attitude must pervade public thought and public criticism more, not

that I mean that you shouldn't be allowed to criticize without coming up with a solution. But what really is needed in this federal government in terms of external criticism are some good ideas about how to meet these problems and not simply a constant recitation of the fact that, you know, "we've got problems." And I guess as Jim Rouse the man who designed the city of Columbia, in Maryland, says, "What we need is more people to talk not in terms of what needs to be done, but in terms of how to do it." This is, I think, the thing that impresses me most, because I've gone back to my college and university, and all they tell me is, "We've got this problem," and I said, "Well, what in the hell do you think we ought to do about it?" And they said, "Well, I don't know, but we've got this problem and somebody ought to do something." Or "they" ought to do something. I think that as soon as the "we's" and the "they's" realize they are in the same boat that maybe we can begin to get down to business. I would really say that this is the thing, the greatest lesson that I have learned in my experience here, and it applies across the board, not just to science and technology.

M: Thank you very much for the interview.

B: Thank you.

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By Ivan L. Bennett, Jr.

to the

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