

**Alain C. Enthoven Oral History Interview – JFK#1, 06/04/1971**  
Administrative Information

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Enthoven, Deputy Comptroller, Assistant Secretary, Department of Defense (1961-1971), discusses his impressions of Secretary of Defense Robert S. McNamara and his work applying systems analysis to Defense Department problems, among other issues.

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## Alain C. Enthoven – JFK #1

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Oral History Interview

with

ALAIN C. ENTHOVEN

June 4, 1971

Beverly Hills, California

By William W. Moss

For the John F. Kennedy Library

MOSS: Professor Enthoven, let me begin by asking you just who you are, and how you came to be a part of the Kennedy-McNamara [John F. Kennedy and Robert S. McNamara] Administration in the Defense Department in 1961. What were the events in your life that led to a confluence of these two streams, if you will?

ENTHOVEN: Well, I'm not sure how far back to go in ancient history, but after I graduated from college—I went to Stanford [Stanford University] and majored in economics—I was a graduate student at Oxford [Oxford University] as a Rhodes scholar. There I met Harry Rowen [Henry S. Rowen], who had been at the Rand Corporation, was on leave from Rand to get a degree in economics at Oxford. At Rand he'd worked for Charlie Hitch [Charles J. Hitch], who was then head of the economics division of the Rand Corporation. At Oxford Harry Rowen and I became very close friends, and have remained so to this day. After I left Oxford I went to MIT [Massachusetts Institute of Technology] to get a doctorate in economics and it was, I think, Harry's idea to have Rand invite me out for the summer between my two years at MIT. So I came out to Rand and worked that summer on problems of strategic air power and related questions, and there I became acquainted with Charlie Hitch, Albert Wohlstetter, and various others of the people that were working on those problems at Rand. As a result of that experience, a year later when I was on the job market, I decided to accept an offer from Charlie Hitch to come out and join the

economics division at the Rand Corporation. That was in 1956. I got to Rand in the summer of '56. I worked there until the spring of 1960, except for one quarter when I went off to be a visiting professor.

Gradually it became apparent to me as I worked at Rand that we were doing very important studies on very important matters, on which we had conclusions that really should be listened to and acted on, but that our studies were not being acted on and were being received politely and filed away. I became rather fed up with that state of affairs.

MOSS: All right. To whom were you making these studies?

ENTHOVEN: For the Air Force [United States Air Force]. Rand's main customer then, and even now, is the Air Force. I'd been following, in general, the whole question of defense organization and management. I came to the conclusion that there wasn't much point in doing these studies and analyses in a situation in which the decision process was irrational, in which the overwhelming and dominant factors were service parochial interests, bargaining over budgets, jockeying for position, fighting for prestige units, rather than some rational determination of what was in the best interest of the country. It seemed to be exceedingly difficult to get anyone to take serious some of our most serious strategic problems. Rather, they were concerned about the political positions of the players and so forth.

So, along about 1959, I decided I'd like to do a study and a book on the subject of the organization of the Defense Department, with special reference to the decision process. I told that to Charlie Hitch, and he suggested, rather wisely, that if I wanted to do such a book I ought to go and spend at least a year or so in the Pentagon and find out where the walls and the woodwork were. I agreed with that, and so I applied for a job in the office of the Director of Defense Research and Engineering. After many months of negotiation and discussion and processing of papers, and so forth, it was settled. In April of 1960, which was still, of course, under the Eisenhower-Gates [Dwight D. Eisenhower and Thomas S. Gates, Jr.] Administration, I packed up my family on a plane and we moved to Washington. I think, as things turned out, that was a very providential act, because it meant by the time McNamara and company arrived that I knew a lot about where the walls and the woodwork were, and what some of the main problems were firsthand.

MOSS: So you were working for York [Herbert F. York] and Rubel [John H. Rubel] at that time.

ENTHOVEN: Yes. In fact, York didn't know me, and Rubel barely knew me, although I got to know Rubel then and we became good friends. That, many years later, is the main factor leading

to my coming to Litton Industries [Litton Industries, Inc.].

I was a grade 15 civil servant. I mean I was pretty junior on the totem pole. As a matter of fact, before the change of administration I don't think I ever did meet Herb York although, again, we did become friends.

MOSS: What sort of things were you doing?

ENTHOVEN: Well, it was supposed to be an office of planning. It was supposed to introduce some planning into the research and development program on weapons systems but in fact, it was too little, too small, not enough top-level understanding and backing, and there really was no planning.

MOSS: Did you get any feel at that time for Gates' moving in the direction that McNamara eventually did in the consolidating years?

ENTHOVEN: Well, yes, a little bit, but not very much. The problem is that the Pentagon is a huge bureaucracy with a lot of inertia, and one man, no matter how able and how well intentioned, can't do it by himself. I think part of the reason for McNamara's unusual effectiveness is that he was able to come in in the administration of a very effective and attractive president that a lot of good young men wanted to work for, and he was able to assemble a team of people that was extraordinarily competent and, for one reason or another, well equipped for the jobs they took. I think probably one thing, the President's age, meant there was something of a breakthrough possible in the ages of the people who took the various jobs. I think, in many cases, a typical presidential appointee under the Kennedy Administration was probably twenty years younger than his predecessor and likely to be a lot more dynamic, hard-driving; people, in many cases, who hadn't made their reputations yet and were going to do it there, rather than people who'd made it someplace else and were now in a later career and not like to drive as hard.

MOSS: Okay. How were people looking at the election as it was taking place in 1960, the campaign and so on, from the Pentagon point of view? Do you recall how you looked at it?

ENTHOVEN: Well, I was certainly hoping for Kennedy to be nominated and to be elected. I don't recall anything extraordinary. I think that the people in the Pentagon were pretty much like people everywhere else, divided into a spectrum of opinion on political matters. Of course, the whole question of military preparedness was an important issue in that election. So I suppose there was a good deal of interest in the thing.

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Then, just to wrap up my own story as to how I came there, let me just say one or two things about Charlie Hitch. Charlie was a Rhodes scholar who studied economics at Oxford back about 1932. He was about twenty years ahead of me, as a matter of fact. He was at

Queens College, Oxford, and he stayed on there as an economics don and, in fact, established a reputation for himself of considerable distinction as an economist and a scholar, and was there up till World War II. After the war he and his wife were back there for a while, but when he was offered the job at the Rand Corporation to found and build their economics department he found that attractive and accepted that position; and so was the head of the economics department when I met him in 1955, that summer.

When McNamara was appointed to be Secretary of Defense, he had the help of the talent hunters, whoever they were, Yarmolinksy [Adam Yarmolinksy], Shriver [R. Sargent Shriver, Jr.]....

MOSS: Shriver and Yarmolinksy. Right.

ENTHOVEN: ...and they turned up Charlie Hitch's name for him. One of the things that probably called Charlie's name to their attention—although I'm sure there were others also—was that Charlie had just published a book, *The Economics of Defense in the Nuclear Age*, which is sort of a bible not only for the economics of defense but for the whole field of program planning and analysis in government. It was a big step forward in thought about how to think about public expenditures, how to analyze them, and so forth.

So McNamara and Charlie met early in January in 1961, and I'm told it was love at first sight. So Charlie became the Comptroller of the Defense Department. Immediately upon that happening, he phoned me and said that he was going to be the comptroller, and would I please move over from the office of the Director of Research and Engineering to the Comptroller's office; that he did not yet know exactly in what capacity or how or why or what but that he felt he needed me as an assistant and as a friend. We knew each other pretty well, and he knew that we both thought in the same way, along the same lines, so that I could sort of be an extension of his own effectiveness.

Immediately upon his getting there, McNamara ordered that there would be a complete overhaul of the whole defense budget, and he broke it down into three parts with three task forces. One was on the whole strategic nuclear business—strategic offensive and defensive forces—with Charlie to head that. Charlie asked Dr. Marvin Stern, who was one of the Deputy Directors of Research and Engineering, and me to work on that with three military men. Then there was a task force on limited war forces headed by Paul Nitze [Paul Henry Nitze], with Harry Rowen and others working on that one. And then one on the

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R and D [Research and Development] program headed by Herb York. Very soon after that got under way, Charlie Hitch got pneumonia and went to the hospital for a few weeks. So I was kind of, by circumstances, pitched into the situation and was working directly with McNamara, and sort of won my spurs that way.

MOSS: All right, let me ask you this. Who else was on that task force with you? How was it made up? Who were the people?



ENTHOVEN: Well, the typical make-up, as I recall, was, you had the head of it, like Nitze for limited war forces, as I said, York. By the way, then Charlie Hitch as Comptroller had the job of pulling the whole thing together, so he had kind of two positions in the thing. When he went to the hospital I found myself doing both of them. I think the typical pattern was a couple of civilians one way or another associated with the McNamara team, and a military man from each of the services. In the case of the ...

MOSS: Was JCS [Joint Chiefs of Staff] separately represented?

ENTHOVEN: Perhaps. Probably, yes. I'm just trying to think. In the case of our strategic offensive and defensive, it was then a colonel, later to become general, Richard Ellis [Richard H. Ellis] from the Air Force, Major General Oberbeck from the Army—I forget who our Navy or JCS people were. They were good men though, and we had an interesting time. By the way, for me it was a very exciting opportunity because it was a chance to put into effect a large number of recommendations coming out of the Rand studies. Just before leaving Rand I had completed a book classified, a top secret book called *Can U.S. Strategic Air Power Survive in the 1960's?* It was all about the problem of the vulnerability of our posture, which was very acute. Our whole air defense system had its controls centered in about twenty control centers which, if knocked out, would have rendered the whole system useless. So we'd spent twenty billion dollars for something that the Soviets could knock out with twenty ICBMs [inter-continental ballistic missiles]. It was a ridiculous state of affairs. One of the things that I was able to do was to have us stop, cut back spending on that, and instead to restore some of the so-called manual control of decentralized sites. So that if we did have an attack, we wouldn't have our air defense system completely knocked out in the opening minutes of war.

The backbone of our strategic retaliatory forces were in the bombers that were based, soft and concentrated on some 40 air bases, approximately. So there's 40—or, let them have a safety margin, 120—ICBMs from the Russians, and that's all gone. See, the problem is that the military leaders responsible for those decisions were not

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thinking in terms of the possibility of a Soviet attack on our forces and the need for a survivable deterrent...

MOSS: Are you thinking particularly of White [General Thomas D. White] and LeMay [General Curtis E. LeMay], and people like that?

ENTHOVEN: Yes. I'm thinking particularly of the generals who had spent their careers building the strategic bomber force. In saying that, I don't want to disparage them as men. I think that in their time they did a very great service to this country, and I think they're very capable men and very capable leaders. LeMay did one hell of a job in building the Strategic Air Command. It was an extremely impressive, effective, efficient organization, and so I'm not trying to disparage LeMay. I

have a great admiration for his leadership ability and his managerial ability. However, I think it's important to recognize, no matter how much you respect a man like that, that not only can he be wrong on a major strategic decision, but if he's spent his whole professional life building the bomber force, it's even likely that he's going to be wrong on something to do with bombers versus something else. You know, human beings are human beings.

That was the big problem. Simply what we needed to do was to speed up the Minuteman ICBM program and the Polaris program [submarine-launched ballistic missile system], and cut back on bombers and things associated with bombers.

MOSS: Was the airborne alert situation in a sense a response to this, or was that more a response to the Berlin situation?

ENTHOVEN: Well, as I recall, now it's ten years ago and on details I'm inevitably going to be a little vague.

MOSS: Pick up the percentage of B-52s in the air at one time.

ENTHOVEN: I remember one of the main things we did in the task force was increasing the ground alert from one-third to 50 percent; which we did, we said, as an interim measure for a few years, four to six years, until the Polaris and Minuteman buildup had occurred, and then we would undo it. That's just what we did.

In the case of the airborne alert, that was not a major factor, but what we did do was to buy extra spares and supplies so that you could go on to an airborne alert in the event of a crisis. We didn't think the airborne alert, as a regular peacetime measure, was a very good approach to the problem. It was extremely expensive, and naturally, a certain number of bombers were always in the air from training, but to increase it above that would be a very expensive thing to do. So we didn't encourage it.

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MOSS: You mentioned a moment or two ago that you were beginning to apply some of the recommendations that had come out of your Rand studies. What were some of the others of these recommendations, and how were they being received by people on the task force? Did you have a rough time getting them across?

ENTHOVEN: Well, the main recommendations were the ones I have described. That is, that we must change our posture from one that is soft, concentrated and vulnerable to one that is relatively invulnerable to Soviet missile attack, or combined missile and bomber attack. That meant, for the offensive forces, going from bombers that were based soft and concentrated aboveground on a few bases, to something like the Minuteman ICBM that was dispersed, one missile to a silo, to Polaris submarines. To protect the command control and communications system, one of the things that we did was to establish alternate national command posts, one on a ship and one, it's an

aircraft constantly in the air. We arranged to have airborne communications relays constantly in the air, so that the communications system couldn't be knocked out, and a whole series of things like that.

MOSS: These all sound very practical.

ENTHOVEN: Yes.

MOSS: Was there any resistance to it, or did people see the logic of it immediately?

ENTHOVEN: Well, certainly in McNamara's case, there was no resistance at all. One of the things that tremendously impressed me, I remember, in my first meetings with McNamara is, I went over the problem, I explained it, and he saw the point right away. It just struck me as such an extraordinary change from the previous, from the pre-McNamara situation, to be able to sit down with the Secretary of Defense, explain a problem like that, have him see the point right away and decide that he's going to act on the basis of the merits, and not get all tangled up in the inter-service politics and so forth. There was some disagreement, and some foot-dragging, but, by and large, since the services saw that we were planning to increase the budget considerably, and all of these were coming as additions to the defense budget, the resistance was not too great.

I think under the previous administration they had done the budgeting by service. Over the years, each service had a certain traditional percentage of the defense budget. So, along came Polaris, and the Navy says, "Well, that's not a Navy program, that's a national program so, Mr. Secretary, if you want that, you have to provide some money. We're not against it. We think Polaris is a great idea, but we don't want to cut back our aircraft carriers or our battleships, or whatever else it is, in order to get it." In the first few months there, McNamara did cut back and cancel certain other things.

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I remember—oh, what was it? The Navy wanted to put Polaris missiles on a cruiser, which was an extraordinarily bad idea. The reason it's a bad idea is, it's important to separate your nuclear war forces from your conventional forces if you want to be able to use them in a conventional war. Because, when you're in a conventional war, it's likely to be a time of the greatest strain in your deterrent, you might say. It's a time when you don't want your deterrent to be being shot up and damaged. In effect, you have to make a choice. Dual capable forces—that is, that are capable of either conventional or nuclear operations—are generally not a good idea, because, in the event of a conventional war, you have to preserve your nuclear deterrent ready and effective. So putting Polaris missiles on cruisers really was not a good idea. It turned out, moreover, that it was not at all economical. Even given that you had the cruiser, it cost just as much to buy and install the missiles and everything else as it would on a submarine.

MOSS: Yes. You've got platform problems on a service ship; it's a technical problem.

ENTHOVEN: Yes. That's right. So it wasn't an economy in any sense. I remember we stopped that. But the Navy had wanted that, I think, because they thought that was a way of getting more cruisers, which they'd like to have. That would fit in with their traditional missions and Surface Navy and so forth. They had offered up some other ship, I forget what, to be dropped out of the budget and program in exchange for that, and then when the cruiser was stopped they reinstated the other ship. McNamara heard about that, I remember his saying, "Get that ship!" I didn't know what he was talking about, and I had to scurry around and get some explanations to find that, and what he meant. I didn't know what he meant by "that ship." But, I mean, he was willing to, and did in a number of cases, make cutbacks in other things in order to pay for these increases. But still, it was apparent that we were substantially increasing defense spending that year.

MOSS: That's interesting. When there was something like that that you didn't understand, would you come back to him and say directly, "What do you mean?"

ENTHOVEN: Yes. Sure.

MOSS: Or did you have to sort of go around and find out?

ENTHOVEN: Oh. Well, no. Well, it would just depend. I mean, you used common sense. But I always felt perfectly able to go back to him and ask him a straightforward question, what did he mean?

MOSS: You've mentioned once or twice the rational as opposed to the irrational, and this seems to me to lie at the base of most of the argument about your performance in the Defense

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Department. I've seen various arguments that the situation is really political, it's really irrational, and that what you do is understand it and play it to the best advantage; rather than to try and change it. The argument being that it can't be made rational, because these are men acting in an adversarial, or self-interest kind of way. How do you respond to that?

ENTHOVEN: Well, I wouldn't use the word irrational. I would just say it's a question of goals, and a question of incentives. I'm saying that the way that McNamara configured a decision process, and the way it ought to be configured, was for the Secretary of Defense to determine what is the national interest, or the public interest, in each of the major program areas; then to state that public and explicitly, and to defend that before the Congress. If it doesn't sell, you argue that out in the political

process as to, what are we trying to do? Then, to try to derive in some rational way the best programs to meet those goals.

MOSS: This is presuming that they are objectively discoverable.

ENTHOVEN: Well, I don't think that the goals are objectively discoverable in the sense that I don't think you can mathematically derive whether you should seek damage limiting or assured destruction or not. You can arrive at that by a process of study and judgment, and consideration of alternatives; and then you can defend it in the political process. But it is essentially a value judgment, and therefore not a logically derivable proposition. It is a value judgment that ought to be stated and defended before the Congress, and then, in effect, modified until there is substantial political support for, and agreement on, that proposition, and then go ahead on it. I say that because it's necessary to have the agreement of the administration and the Congress in order to move forward on a defense program.

I am not at all suggesting that there is some alternative to the political process that can make defense decisions without their foundations in value judgments that are politically based. But the alternative processes of decision that I see are, on the one hand, one in which the Secretary of Defense, with help from his staff and his advisors and so forth, sorts out what alternative objectives we might go after, and tries to define clearly and explicitly what are the things we are trying to do; and then, given those objectives, can, not in a completely airtight, logical way, but with the aid of a good deal of analysis and logic, reasonably derive a set of programs that support those objectives. That's one way of going about it.

The other way of going about it, which is the way that it was done before that, was that the administration determined what defense budget would be acceptable, given the general economic situation and the financial goals of the administration. Some scholars have referred

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to it as the remainder method. That is, tax revenues were forecast, irreducible: the domestic spending was subtracted from that, and the remainder was given to the Defense Department. In effect, to start with a financial total, and then parcel that out among the three services on the basis of the historical fractions of the defense budget that they had received in the past. Then, in effect, let them spend it on the basis of an internal political process within the service which divides it up on the basis of institutional interest.

Within the Navy there'll be a great pulling and hauling between the submariners, the Surface Navy, the aviators; between the destroyer people and the carrier people; between the amphibious people, and so forth. People within the Navy tend to become pretty much identified with one or another arm. Similarly in the Army and in the Air Force.

The problem with that kind of process is that it's essentially unrelated to the national need. When important changes in international circumstance or technology occur that make it necessary to change your weapons systems, there is nothing in that kind of process that'll make it happen.

For example, to take, I think, one of the best possible illustrations, in 1961 what needed to be done in this country—in fact it needed to be started sooner—was to make a rapid switch in the strategic retaliatory forces, from the bombers that were soft, concentrated, and vulnerable, to Minuteman and Polaris. Now, the problem is, under the pre-McNamara way of running the department the Navy was unwilling to take the Polaris out of the hide of the existing missions. They were willing to build three Polaris submarines a year, at a time when we should have been building ten or twelve, because that could be fit in to the submariners' share of the budget, but that was all. So they were not enthusiastic for it. Meanwhile, the Air Force, which was dominated by the Strategic Air Command bomber people—I mean practically all the key positions in the Air Force were held by people who had, in their previous tour, served with LeMay at SAC [Strategic Air Command], and were very much identified with the big bombers—were not interested in seeing the strategic mission go from bombers to Polaris either. Nobody had an institutional vested interest in making that happen, so it wasn't happening. It's necessary for the Secretary of Defense to figure out what needs to be done and to make it happen.

But, let me make crystal clear that I would not suggest for a moment that there is some way of deriving defense programs independent of value judgments. It may be that somebody else writing on operations research or something else has suggested that at some point, but I certainly have never done so.

MOSS: No, I think that part of it is clear enough. Certainly everything I've read on systems analysis and whatnot leaves the point of value judgment very clear that it is there.

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ENTHOVEN: Yes. It is an analysis, I think even in 1961 you'll find Hitch and Enthoven scripture saying, "Analysis is the servant of judgment, not a substitute for judgment."

MOSS: Right. I think that what worries people, though, is that the process itself, in a sort of loose, democratic kind of way, should not be as deterministic as the rational interpretation would have it.

ENTHOVEN: The problem with that is that the alternative, which is the politically natural thing to do, and which is the approach to which they have reverted now.... That is, now Mr. Laird [Melvin R. Laird] is, in effect, determining what the traffic will bear and then asking for a little more so that he's out in front of his troops and looking good, asking for money. Then, they divide up the pot that they get three ways, I think in three equal fractions now, and then the services spend it pretty much the way they want. That alternative has the very serious drawback that it is not systematically related to national need. Under that approach you won't get the change from the bombers to Polaris, a whole lot of other similar changes that are needed from time to time.

Within the Army in the early 1960s one of the changes that was needed was a considerable increase in the amount of helicopter mobility, helicopters to fly the troops and supplies and everything around, if we were going to be able to conduct jungle warfare of the sort we did in South Vietnam. Now, at the time the management of the Army was in the hands of people who were tank men, and artillery men, and infantry men, and so forth—there were no helicopter men except for a few lonely souls who were voices crying in the wilderness—there was no systematic process or institutional pressure that was going to make that transition occur.

While I think it's true to say that the McNamara approach is not the politically easy, not the politically natural, way for it to be done, I do think it's the way it ought to be done. I also think that it is the way that much more explicitly and clearly identifies and brings out the key value judgments underlying the whole process, and allows the Congress and others to bring thought to bear on those value judgments. Whereas the alternative approach, the pre- or post-McNamara approach, has the disadvantage that it's not at all clear what national policy value judgments are underlying the posture. There's no necessary link up between the broad statements of the President and the actual defense program coming out at the other end.

MOSS: All right. Let me go back and ask you about the beginning days again. How did you see the McNamara team developing? What were your impressions and what was McNamara doing? What was he requiring of people early in the game?

ENTHOVEN: Well, what I saw was coming into place very quickly a team of extraordinarily competent people, some of whom I knew either personally or by reputation, most of whom I didn't,

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or they were just names to me, you know. But very quickly I saw at work group of very competent men who all shared certain basic attitudes and points of view. That is, they thought in the same terms that I've just been describing, that is that defense is too important to be left to the vested interests of the services, a feeling that reason needs to be brought to bear on it; that we ought to define explicitly what we're trying to do and consider alternatives, and that sort of thing.

You know, it was a great departure from previous practice for alternatives to be systematically considered at the top. The traditional military staff process suppresses alternatives as you work up from the bottom to the top. So the general is presented with a staff recommendation to which he says yes or no. McNamara said he wouldn't have that, that he wanted to understand what were the main alternatives, and he wanted to evaluate them so he could bring his value judgments to bear on them.

MOSS: How did you go about talking to the established military people about this? How did you establish relations with them, with the Whites and the LeMays, and so on?

ENTHOVEN: Nothing mysterious. We just went to work on the problems. We all did a certain amount of giving speeches and that sort of thing. I spoke at war colleges, did others, and that sort of thing. But, mainly, just rolled up your sleeves and went to work on the problems. That was the best way. You know, there was a certain amount of rhetoric and concern and misunderstanding, and normal human problems.

MOSS: I was wondering if there were any regular mechanisms that McNamara was using, meetings, this kind of thing? I think of his little ninety-six questions thing that went around.

ENTHOVEN: Yes. Well, that was a very....Okay. A couple of important early impressions. One was McNamara's determination to ask and get answered on a reasonable basis a lot of the main questions about things. You know, he put out his ninety-six questions, or his hundred questions, or whatever they were, and I went to work on supervising getting the answers to a lot of them.

MOSS: How were people reacting to that approach?

ENTHOVEN: Well, there was kind of a lot of shock and dismay. The list of questions was classified, which I think was appropriate because some of them were classified matters. But nevertheless, someone in the Armed Forces must have thought that McNamara was doing a bad thing and therefore that he should leak it. So the questions were leaked to the press, and published. There was a whole lot of raised eyebrows about that. People didn't think the Secretary of Defense should

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be asking questions about...I remember one of the questions was, "Compare the table of organizations and equipment of the Soviet, the French, German, British, Israeli and American armies," or something like that, you know, a number of the different armies, and evaluate the differences. I think it's a good question and, in fact, it took years of work to get certain aspects of that straightened out.

There were a lot of damn good questions that McNamara asked. I think he did a very good thing. He really shook up the department. But it was the case that there were a lot of raised eyebrows at the time, and some unfavorable editorial comment. It's a curious and remarkable thing, but somehow people thought the Secretary of Defense shouldn't be involving himself in military matters, as if there was anything else there for him to be doing.

MOSS: Do you recall any particular responses from individual people?

ENTHOVEN: No.

MOSS: Okay.



ENTHOVEN: Another thing. One important early impression was his determination to define major questions and issues and get them studied in a rational way. Another early impression is this: that under the previous administration there had been an awful lot of bargaining going on all the time. You know, well, we'll do this if you give us that. A tremendous amount of negotiation, bargaining, and so forth.

Early on in our strategic task force, I forget what it was that we wanted the Air Force to do, but we wanted them to do something. A decision had been made previously to stop buying more B-52 wings. I think we had then thirteen or fourteen wings, and that was going to be it. A proposal was then floated by the Air Force to buy another wing of B-52s, and that got a lot of support on the Hill; and, in fact, I think that the Congress appropriated the money, but we never spent it. McNamara made the point that the procurement of the bombers was five hundred million [dollars]; but to buy and operate the complete force over a five year period was one and a half billion dollars. This was one of the early instances in which he introduced into the decision process a consideration of the total system cost, and not just the procurement cost; and the total cost over a period of years, and not just one year.

I remember an Air Force General—I forget who it was—approached me with a proposed deal: If you give us that wing of B-52s we'll do whatever it is. I took that to Gilpatric [Roswell L. Gilpatric] and explained the proposal. Gilpatric said, "Alain, no deals. We're going to figure out what the right thing to do is, and then we'll do that. No bargaining. No deals. Never again."

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MOSS: How'd this go across?

ENTHOVEN: Well, I thought that was a great breath of fresh air. I think there were a lot of people pretty startled by that. I had to report back, "I'm sorry, General, but we are not going to do business on a bargaining basis. The Secretary of Defense intends to figure out what the right thing to do is, and then he'll do it."

Now, you know, inevitably, in fact implicitly if not explicitly, there's going to have to be a certain amount of bargaining and, in fact, quite a bit of bargaining, and so forth. So it's not a case of black and white, it's a case of more or less. But I think McNamara greatly reduced the emphasis on bargaining and greatly increased the emphasis on the merits of the issues. I think that was a tremendously important thing for the health of the institution.

Another thing I remember, rather striking, early on is, McNamara gave an order that all studies in the Department of Defense would be available to the Secretary of Defense. Now that was quite a radical departure. Let me explain by an example.

MOSS: I also have visions of his desk being inundated with a great mass of things.

ENTHOVEN: Well, the point is that they would....

[BEGIN SIDE II, TAPE I]

ENTHOVEN: I remember, a year or so earlier, back in 1959 or 1960, I was in the Pentagon once, in the office of an Air Force Colonel. At the request of the Air Force, the Rand Corporation had done a study on the Polaris weapons system. The Air Force wanted to get an evaluation and find out about it. The Rand study, in effect, concluded and advised the Air Force, as I recall—but again it's ten or eleven years ago now—the episode had concluded, the Polaris is a very good thing, of course. It fits with the national need. It was advising the Air Force, "Don't fight it. You're going to lose. It's a good thing. Don't fight it, join it," you know, or, "Go along with it."

Before McNamara came in, such as it was, one of the key centers of program analysis was the weapons systems evaluations group, which was a group of mainly civilian but also military analysts, and they were supposed to be doing what my office eventually came to do. The trouble is, because they reported to the Joint Chiefs of Staff, it was very much a committeeed [sic] thing. There was a lot of suppressing reports and a lot of that kind of thing. You know, conclusions being modified by the military leaders of the weapons systems evaluation group, who would bargain over the conclusions.

MOSS: So that there could be a unified recommendation?

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ENTHOVEN: Yes, a unified recommendation, or some kind of trade off or a deal, or some kind of trade-off or a deal, or something. Which was very frustrating to the people in the organization, and had the effect that, over the years, a very few really good people wanted to stay there very long. They did have a number of quite talented people working there at one time or another, but they generally got disgusted and left, although there are some exceptions. But for everyone, all the civilians, it was a very frustrating thing, because analytical conclusions would be modified for institutional, political-type reasons. I'm not suggesting that analytical conclusions cannot or should not be overturned on the basis of explicitly stated value judgments; or even that there's anything wrong with the Secretary of Defense saying about a particular analysis, "Well, I'm sorry, I just don't believe it. I can't tell you what's wrong with it, but I just don't believe it." McNamara did that sometimes, and later on it turned out he was right in not believing it. We just hadn't identified some important factor.

Let me just go on with this episode. One day I was sitting in this Colonel's office. A General walks in. It's General Lewis [Millard Lewis] who is the brother of Fulton Lewis [Fulton Lewis, Jr.]. The Colonel introduces me to the General. Says, "General Lewis, this is the Air Force representative to the weapons systems evaluation group." There follows a conversation over in the corner of the room, which I couldn't help but overhear in part, but not in entirety. What I did overhear was that the conversation concerned this Rand report on Polaris. So after the General left I said to the colonel, "Oh, is General Lewis trying to obtain that Rand report for the weapons systems evaluation group?" And the Colonel said, "No, he's trying to make sure that that report does not get into the hands of the weapons systems evaluation group."

So when McNamara one day decided he was going to order that all studies be made available to the Secretary of Defense, I went to him and recommended strongly against that. I said, "Bob, if you do that, there's going to be much more pressure on them by their service sponsors to bias them in favor of predetermined service conclusions, and you're going to take whatever objectivity there is out of them, if they're going to all be available to the Secretary of Defense." And McNamara said to me, "It's your job to keep that from happening."

MOSS: How did you go about that?

ENTHOVEN: By building up a team of analysts who could take these studies and review them and analyze them and figure out how they got from the beginning to the end, and whether the conclusions followed from the assumptions or not, and what other conclusions might have followed from other assumptions. Gradually, as we built up our strength on important service and JCS studies of requirement issues, we made it a practice to have one

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of my analysts work regularly with the study team, so that my man would know, as much as possible, everything that's going on, and be able to completely reconstruct and reproduce the results; and understand how you got from A to B, so if there were some hidden assumptions he would be expected to know about it and smoke them out, and so forth.

But that was a very important principle that McNamara established, which I later came to recognize was right. I often refer to that in speeches, and articles as the principle of open explicit analysis. That is, that all of the participants should have access to the same analysis, and they might well have different value judgments, and they would be able to introduce them in the context of a common analysis of the basic underlying facts and relationships between cause and effects, and so forth.

MOSS: All right. In all this, you've defended your position very well. Let me ask, if you feel now, looking back on it, that there were any significant areas in which you made quite candid mistakes. Were there any significant places where you went wrong in value judgment, or in analysis?

ENTHOVEN: Oh, sure. I think we had a good batting average, but even the best players don't bat a thousand. You did well if you could bat four or five hundred. Sure, there were a number of areas in which conclusions were reached on the basis of analyses that later on turned out to be more or less....I mean, it's never a question of black or white, right or wrong, but which we would have done differently if we'd known with hindsight what we...

MOSS: I was wonder if there was anything specifically identifiable, or was it a cumulative kind of thing....

ENTHOVEN: I don't feel in my area of responsibility, which was the shaping of the defense program, the choice of weapons systems and the like, that there were very many major mistakes. Generally speaking, I would say the main errors were errors of omission rather than errors of commission.

I would say, for example, just if you're interested in examples, in the early sixties we thought, on the basis of misinformation, that the Soviet tactical air power was greater relative to ours than it later turned out to be on the basis of better information. On the basis of that, we greatly increased the size and capability and expense of our tactical air forces; so that by 1968 I think we were spending some sixteen billion dollars a year on tactical air. Now, I can't honestly say that I know of any reason why the United States needed to be spending sixteen billion as opposed to, say ten billion a year, something like that. I suppose someone else could come along and say, well, you can't prove that it shouldn't have been twenty, either. And that's true. But I would say, my judgment would be, looking back on it, that we were spending too much in that area. We built it up too much in relation to what it really does for you.

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Bombing in North Korea, or tactical bombing, interdiction bombing in World War II, bombing in North Vietnam, I think this country just didn't get its money's worth. Unfortunately, these issues have a way of getting to be very emotional and very ideological, and your views on bombing tend to get tied up with your political views somehow, and I don't do that myself. I have a rather business-like approach to these things. I would just say, looking at it now as a businessman, that that was a poor investment and we weren't getting our money's worth.

If you're looking back in hindsight, in the case of the C-5A, I think that we made a mistake on the estimate of its costs. I don't think that there was a mistake on the program, though. I think that even at the higher cost the C-5A is a good idea. I think it was a well-thought-out program. I think the problems were in the cost estimation and in the execution.

MOSS: Of course, the thing they always throw at you is the TFX [Tactical Fighter, Experimental] aircraft. How do you respond to that one?

ENTHOVEN: Well, I discussed that in our book. I think the main mistake there was going ahead with the thing in the first place. This is, back in early 1961, the Air Force wanted a very high performance interdiction bomber. The Navy wanted a high endurance fleet airplane. I do believe that the services laid onto it requirements that were very unrealistic, and McNamara overruled them on the idea of having one plane for both services. I think that's not a bad idea. I think in the case of the Phantom, the F-4, that was a tremendous success.

By the way, that's something that we did. We rammed that down the throat of the Air Force. The leaders of the Air Force wanted to go on with the F-105. Although I must say in all fairness, there were a number of younger air force officers who on their own, unbeknownst to their leaders, came around and talked to us about the F-4 and said they'd seen it, and they knew it was a very good plane; and it was better than the F-105, which was

the Air Force plane, and it was sure okay with them if we wanted to force it on the Air Force. Anyway, so the principle of both the services using one plane was, I think, established, or shown that it was at least possible to do it, in the case of the F-4.

I think the main mistake was that the services should have been either overruled, or cut back, or treated much more. . . . I think the main problem that made the TFX fail was that the performance requirements that were laid on it were unreasonable, unrealistic and unnecessary. The Air Force wanted it to be able to go for a couple of miles supersonically at low altitude. That's really absurd. There's just no evidence to support the proposition that that is a value thing, unless you want to defeat your enemy by breaking his windows with sonic booms. [Laughter]

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MOSS: Okay. How do you apply systems analysis to some other things? Such as the manpower area, such as counterinsurgency. With strategic weapons it's a little easier to see, but these other things are somewhat different.

ENTHOVEN: Sure. Well, of course it depends what you mean by systems analysis. That's kind of a word of art. It's a term with no fixed or agreed meaning. I've never been happy with the term, but we were never able to come up with a satisfactory alternative. I certainly wouldn't want to be in a position of endorsing everything that everybody does under the name systems analysis. Also, I think that when you get into something like counterinsurgency, the quantitative element becomes much, much less than in the case of something like strategic weapons.

But just to take the problems that you raised. In the manpower area, we found that in the case of manpower requirements it was possible to do a great deal by intelligent and imaginative quantitative analysis, and I could give you a very important example. Along about 1955 or 1956, it was alleged that we had a severe pilot shortage, shortage of airplane pilots, in the Defense Department. So, up to then, McNamara had been pretty much rubber-stamping the service requests for more pilot training without giving it a lot of attention. For one thing, we didn't know how expensive it was. The requests always came in small increments, and they didn't appear to be a major issue.

But when it started being in the newspapers and told to the Hill that there was a big shortage, that made it a major issue, so McNamara asked me to get a team to work on it and to really dig into it. Also, by the way, it was the province of the Assistant Secretary for Manpower until 1965 when I became Assistant Secretary for Systems Analysis. One of the things I did was to take over manpower requirements, interestingly enough, at McNamara's insistence. I rather resisted it at first, for various reasons, and tried to talk him out of it. He absolutely insisted, and I must say within a few months I saw that he was absolutely right on that.

Okay. We went to work on the pilot program. The first thing we found was that what the services were using as their criterion for how many pilots were needed was a list of what they call pilot billets; that is, specific jobs requiring a pilot. Now, where did that list come from? Well, for one thing, after the Korean War there was a great hump, a great, large supply

of pilots. So, many jobs had to be found for these people, and so many jobs were identified as pilot billets that had absolutely nothing to do with flying. One-third of the jobs in the computer center somewhere were defined as pilot billets. I remember at the Air Force Academy the professors of political science were defined as pilot billets. That's just not a logical way of going about doing it.

MOSS: Was this tied in which the flight pay question, too?

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ENTHOVEN: Well, tied in but separable. We could separate that out. We got into that question, too, but that's a different story. I may leave that out for now.

I remember one day, on this question, I was meeting with the Air Force early on in the thing, and we were reviewing this list of pilot billets, and I challenged the need for having professors at the Air Force Academy be pilots. I remember a very angry Air Force General said to me, "Dr. Enthoven, are you a Catholic?" And I said, "Yes." He said, "Well, would you like to have your children taught in school by Mohammedans?" [Laughter] I'm afraid I didn't give him a satisfactory answer. I said, "Well I don't know. I mean, I guess I don't feeling too strongly about that. I do want them to learn their religion." And then he said very strongly, well, he thought that Air Force cadets ought to be taught by pilots.

Well, what that conversation helped to convince me of was that it was fruitless to have a civilian Assistant Secretary, or a civilian leader of any sort, arguing that kind of argument with the Air Force. We had to figure out some other approach to the problem that would not bring on that kind of confrontation. That was ridiculous.

So, we went at it this way. We said, let's look at other criteria. First of all, we have a force of aircraft in being, combat aircraft, training aircraft, supply airplanes, and so forth, and each of these has an approved crew ratio. We may go back and question the crew ratio as a separate analysis, and in fact we did that in a number of cases. But let us, for the sake of this stage of the analysis, take those crew ratios as given. Then we can take all the airplanes and multiply them up by the crew ratios; and that gives us a part of our pilot requirement. Then, if we go in that line of thought, we can identify other jobs that really do require a pilot, a squadron commander, a wing commander, a base operations officer, the officer in charge of the control tower—jobs that are closely related to flight operations, where you want to have the men.

All right. In that connection, we may find some jobs where there are differences in judgment, and there may be some that are contested and we can argue the merits of specific ones, but in fact, reasonable men can come pretty close to agreement on that, and we did. All right, that's another category of jobs. Then we said, we'll call that your core requirement, that everyone will agree you've got to have that many pilots to fly the planes and do the operations.

Beyond that, you need what we'll call a supplement, and that could be based on any one of several criteria. You should meet all of these criteria, in fact. First of all, we are planning our posture in general, that is we're planning our numbers of aircraft, we're

planning our logistics, how many months' supplies of bullets and bombs, and all these other things, on certain planning assumptions about the size and duration

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of the wars we might fight. Put very simply, we're planning that roughly half of our general purpose forces be able to fight a war of indefinite duration in Asia, and therefore, for them you have to have enough bombs and bullets in inventory the day the war starts to carry you over til production can sustain you.

In the case of Europe, we're planning on the basis of a war of ninety days' duration. And you might say, "Well, what's the logic of ninety days? What do you do on the ninetieth day? Do you surrender?" The only defense of it I can give is that that's substantially more than anybody else is doing and it's very expensive to get more than that. It's another whole complicated issue.

But you can see, anyway, we had certain planning assumptions about the war. So we said, we'll combine those planning assumptions with certain explicit ground rules about the rotation policy with respect to pilots, rotation policies which were followed in World War II, Korea, the Vietnam War. That is, pilots will be trained, will fly so many sorties in combat, and then will come out of combat for such a period of time and then will go back again. We were using the ground rules that were in effect, and there was no disagreement about that.

On the basis of that we derived, in effect what supply of pilots was needed in the system to be able to rotate the pilots and sustain those rotation ground rules for the planned wars. On that basis we derived a number of pilots called the supplement that was required.

Then we said, now there are other criteria that have to be examined. For example, in the case of the Navy there is the problem of sea duty versus shore duty, and the Navy is very concerned about that and legitimately. What percentage of the time are the pilots at sea? Because if you keep them at sea too long, then you will destroy their family lives, their morale; your retention will fall off, and maybe you can maintain a force, but it won't be professional and ready; and certainly it will be unduly expensive because it's so expensive to train pilots. So we understood and accepted that. So we examined the requirement that we derived, and said, if we buy the core and the supplement that we have, what will its implication be for the sea to shore ratio? And if that's not satisfactory we'll increase it on that account.

Another one was rotation with respect to what were called career development jobs. Here it was important to make a distinction between pilots in their first tour of duty and pilots after their first reenlistment. We made the point that a man in his first tour—that is four years, or whatever he's obligated for, after he's gone to flying school—should be expected to be flying all the time. It's so expensive to train a pilot that a young man at that point should be flying all the time and you can expect him to be at sea most of the

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time. We just have to be able to do that. But, after that, we should be concerned about his career development. He should be able to go to graduate school, work in the Pentagon, and all those other good things. He should be able to get home with his family, and so forth. In

fact, we found that the requirement derived on the basis of the core and the supplement for the rotation in war was enough to assure satisfactory career development assignments and home life.

So on that basis we came up with an analytically derived pilot requirement in the context of which there were certain remaining disagreements. For example, one issue that we disagreed with the Air Force on was, should you have two pilots, or a pilot plus a navigator, in the F-4? This was a very interesting issue. Let me explain briefly how we handled it, because it'll illustrate some of the ideas of the approach here.

The Navy and the Marine Corps use a pilot and a navigator, radar operator person, in the back seat of the F-4, pilot in the front seat. The Air Force, in 1961 when the F-4 was introduced, decided to have two pilots. At the time, we didn't know how much that cost, and that's one of the mistakes we made. We went along with it without knowing how much it cost. I don't think the Air Force knew how much it cost either, they just wanted to have more pilots.

By the way, I think they had a problem of legitimate concern, and that was, there was a time when it was reasonable to think of most of the officer corps of the Air Force as being pilots. But, I think that by 1968 it was something like thirty thousand pilots out of a hundred-and-fifty-thousand-man-officer corps. You can see that the number of pilots has an important impact on the image of the Air Force officer. At some point, if the pilot requirement gets to be too small, then the pilot becomes instead of the leader, the generalist, the prospective leader of the Air Force, the pilot becomes a minority specialist. I think the Air Force people felt very strongly they wanted the pilots to be the leading people.

One of my analysts, who by then was tougher and braver than I decided to take on this issue. The first thing he did was to get our cost analysts to do a detailed analysis of how much this extra pilot cost. To my surprise it was one hundred million dollars a year, which is a substantial amount of money. Then, he sent that analysis to the Air Force, who were horrified by it, but fortunately, by now we had our procedures well enough worked out that they understood. Secretary Brown [Harold Brown], Secretary of the Air Force, understood and insisted on open explicit analysis and fair play, and so forth. If they didn't like the conclusion, they had to go through the thing in detail and indicate where it was wrong. They reviewed it in detail, and there were some disagreements and it was negotiated, and I think we came out with ninety-eight million dollars a year as the agreed cost estimate.

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Then, my men went to work on the question of the merits of it. We got them to lay out all the arguments and reasons why there ought to be a pilot in the back seat. One of them was, if the pilot in the front seat is injured, then the pilot in the back seat can fly the plane home. So we said, now we have a lot of experience in the Air Force and the Navy and the Marine Corps in combat, flying over North Vietnam and so forth, and we're going to analyze all of that very carefully and see, is that real, or is that imagined. It turned out, in thousands and thousands of sorties, only once had it happened that the pilot in the back seat flew the plane home; the pilot in the front had had his hand hit by shrapnel or something, when, upon interview, the pilot in the front seat said he could have flown the plane home perfectly all



right. So the problem is, if the plane is hit badly enough that the pilot in the front seat is injured, it's likely that the plane is going to go down. But the question is, in fact, is there any likelihood of this situation occurring?

Well, we took each of those things, and just examined the facts and the evidence, and so forth. Finally, they had to throw in the towel and admit that they just couldn't, in the face of the facts and evidence, sustain any of the arguments. A program was developed to phase out the second pilot and to replace him with a radar navigator, a saving to the tax payers of one hundred million dollars. So I give you that as an example to suggest that some aspects of, certainly, the manpower quantitative analysis, the analysis, of course, being a framework in which a lot of specific value judgments can be brought to bear.

Let me emphasize, of course, that the whole analysis rested in its foundations on a whole series of judgments, judgments about what is the appropriate crew ratio, about....There's no mathematical formula that will tell you what is the right amount of combat exposure, but there seemed to be a consensus as to what was a reasonable tour; by historical precedent and so forth, there were precedents established. So that the foundation of the whole thing was value judgments, but it was possible to greatly increase our understanding of it, and to bring fact and evidence and reason to bear on pieces of the problem and reach a conclusion.

So no, you asked about counterinsurgency. Well, I think, basically the problem of insurgency is a political problem. However, I think if you're going to conduct any sort of organized military operation, that there is always room for evaluation and analysis and bringing facts to bear. It's not all a matter of feeling and opinion. We did try to encourage the military to do some systematic analysis and evaluation of the effectiveness of alternative kinds of operations. We were much less successful than we would like to have been. Let me just make very clear, I certainly am aware that the element of numbers and quantities and mathematical relationships, and so forth, is much greater in the strategic nuclear than in the counterinsurgency thing. Although in everything, the foundations of the whole thing include value judgments about objectives and alternatives, and the like.

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MOSS: I wonder about the argument that the preoccupation with the quantitative led to a lack of intuitive understanding of a situation such as Vietnam.

ENTHOVEN: I don't doubt that there was a lack of intuitive understanding of the situation in Vietnam. But I don't think that there's any reason to suppose that that was based on a preoccupation with the quantitative. After all, the basic policy decisions on Vietnam were made by President Johnson [Lyndon B. Johnson] on the basis of advice from all kinds of people, only a small minority of whom were in any sense quantitatively oriented. I mean he had the advice of the Secretary of State and all those people; the CIA [Central Intelligence Agency], the people in Congress, and so forth. Certainly I do believe now that this country made some very serious mistakes in its whole approach to Vietnam...

MOSS:                   Where do you see the origin of those mistakes? How did they come about?

ENTHOVEN:           Oh, I think that the origin of the mistakes, the roots, are very deep in the Cold War, in our attitudes to communism, and our assessment of what was actually going on in Vietnam. This is a very long and complicated question I just couldn't begin to do justice to in a tape. But let me just give you one of two thoughts on it to illustrate the point.

I recall back in 1960, in the presidential campaign, that Nixon [Richard M. Nixon] was saying that not one square inch of the world's territory had been lost to communism under the Eisenhower Administration. And Kennedy was talking about these islands offshore in China and trying to make the point that we shouldn't fight, bleed and die for those islands, as a way of just kind of indicating a desire for a little bit of flexibility. But it still was the case in the early 1960's in this country that anticommunism was very strong, and the idea that any encroachment by the communists would be a disaster; and politically it was felt in the administration that it would be a very costly thing "to lose any territory to the communists," as if it was ours to lose.

I think if you reread today those Kennedy-Nixon debates on that subject, you get an important insight into the climate at the time. So, it involved not just Kennedy or Johnson. It involved the whole Congress, the country, the whole national mood.

I think another thing is that the basic perception of the situation at the time was that there were clean, honest, democratic, good people in the south who were being invaded by bad communists who were part of a world international monolithic conspiracy in the north, who were invading them. Well, I think, as experience has shown, that just doesn't fit the facts. That is the theory that everyone, or most people, believed at the time. I think it's subsequently become very clear, for one thing, that there are substantial areas of South Vietnam that had been occupied by the Viet Minh from the time of World War II, so that in effect what we were trying to do was not repel an invasion, but roll back communism in South Vietnam. Whether that's wise or not,

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it's certainly highly questionable, the wisdom of that. We don't find it wise to try to roll back communism in eastern Europe or anywhere else.

As to how honest and effective and democratic, and everything else, these people are in South Vietnam that's a whole other question, the monolithic character of communism. Subsequently it became more and more clear that there isn't such a thing as the Sino-Soviet bloc. The Russians and the Chinese aren't very friendly, and the Vietnamese and the Chinese are not all that friendly. In fact, if we are really concerned about China, as Dean Rusk so strongly insisted for so long, then the last thing that we would want to do is kill thousands of Vietnamese, North Vietnamese or any other kind of Vietnamese. It's quite significant to me that the Vietnamese have managed to keep the Chinese out of North Vietnam.

MOSS: Okay. One of the problems, of course, in this political area is the question of intelligence estimates. This, I understand, was something that worried McNamara a great deal, the National Board of Estimate things.

ENTHOVEN: Yes.

MOSS: How did you go about trying to make this a more rational and more useful process?

ENTHOVEN: I was involved a great deal in these estimates because I soon found that intelligence estimates on enemy forces were at the foundation, or one of the foundations, of our requirements, and that this was too important to be left to the intelligence specialists. So, in fact, in involved myself very deeply in that.

MOSS: Then, of course, there were all those erroneous estimates in the early days—the Soviet missiles, what constitutes a Soviet division, is it comparable to ours? That kind of thing.

ENTHOVEN: Yes. Right. The CIA people, when I'd raise these issues, always used to say to me, "Well, it's not the estimates that you're questioning, it's the interpretation of the estimates." I would say, "It's your responsibility to see to it that the estimates are not so badly misinterpreted." But just in a thousand ways, there is a bias toward overstatement of the enemy relative to us, and all kinds of people believed that when in doubt the safe thing to do was to overstate. I remember once saying to the Director of the CIA, that was Mr. McCone [John A. McCone]—I think it was probably the first time I'd met him, at a dinner party when we were introduced—and I said, "Mr. McCone, I want you to know that it can be just as

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dangerous to overstate the enemy as to understate the enemy." He said he didn't agree with that, and that's kind of where we differed.

MOSS: ...standard form...

ENTHOVEN: No, I think that, at least as far as NATO [North Atlantic Treaty Organization] is concerned, I feel that just in recent weeks it's become clear that the point of view that I fought for has succeeded. I was very pleased to see sometime in the past two or three weeks in the news magazines, a comparison of NATO and Warsaw Pact forces. It started, as I would have started, with the total men under arms on both sides: five point something million on NATO, three point something million, Warsaw Pact. Then, soldiers in Europe: 1.1 million NATO, 1.2 million Warsaw Pact. And then you go on down from there. The big problem was to get them to count

soldiers rather than to count divisions, which sounds awfully simple with hindsight; but believe me it was exceedingly difficult going in.

In our book, *How Much is Enough?* we have a chapter on NATO in which we lay out the intellectual history of the ground forces and the tactical air forces. But I'd just like to emphasize that it was a very severe problem, and let me illustrate it this way: There was no piece of paper to which McNamara and I gave more attention—there were others that we give as much attention to, but no piece of paper to which we gave more attention—than a table which compared our strategic retaliatory forces with those of the Soviet Union. We gave a lot of attention to that because there was a great deal of political concern about that. The Congress was very interested, and so forth. McNamara and I both worked very hard to try to get the comparison made on equal ground rules for both sides. We worked on that, believe me, for, in my case, eight years, in Bob's case for seven and a quarter years, however it was. We made a lot of progress.

A typical problem that we encountered was that, in counting bombers on our side, the JCS comparisons and the ones provided by the services and everybody else, they would count what's called the unit equipment, which was at the time something like six hundred B-52s, those in the combat units; for the Soviets, they would count the total inventory. Well, we had in our inventory seven hundred B-52s, and so we were comparing their seven hundred with our six hundred, except that they had fewer bombers. But thereby, we were overstating them relative to ourselves. The point is, each one of these things might have been a 10, 20 percent overstatement; but, if you add a 15 percent factor to the enemy relative to yourself in five different ways, you have doubled him relative to yourself, and you can greatly distort the picture.

I remember back in late 1967, as Bob always wanted to do at the end, kind of wrap up his whole budget presentation for the year in a statement and some tables that laid out the basic facts and so forth,

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it probably was in December of that year, and my phone rang. He had a phone where you could press a button on his panel and then the bell would ring directly by my desk, and I'd pick up the phone and say, "Yes Bob, what's up?" [Interruption] Okay. Bob said, "Alain, get out the strategic table," but with some humor in his voice. I said, "Okay, I got it." "Look at line such and such." And I looked at line such and such. He said, "Look, now we have submarine-launched missiles on their side and our side, right?" "Right." "What is the definition of a submarine-launched missile on our side?" I said, "Bob, that is a Polaris submarine that is combat ready and at sea." You see, you have Polaris submarines that are on station; then you have other ones that are at sea, then you have other ones that are in the dry dock. So, when you put in your table "number of Polaris missiles," which one do you mean? So I said, "If you took the total number of submarines times the total number of tubes you'd get six hundred and fifty-six, I think it was, or something like that. But, of course, some of them are in the dry dock at any one time." He said, "Look. Look at the Russians. What's the definition for that?"

MOSS:                   Then you've got the golf class in there and...

ENTHOVEN: And I said, "Oh, my gosh, I see it now. The Russian submarines in the dry dock are included in that total." This was several hundred missiles. Well, you know, once again the comparison has been biased in favor of the Russians. Here, after years of hard work and determined intention, we really wanted at least in one case to get down to bedrock fact and clean this thing up. And here, after all that effort we put into it, still the whole system in which we're operating is so biased to overstate the enemy relative to ourselves that this thing, nobody had caught it. That just illustrates the problem.

That, I think, brings out what might be a good concluding thought for me to say about one of the main things I found and learned about analysis. That is, the problem of analysis of policy and programs, and so forth, is not manipulating the data once you've got the basic facts right. Zillions of literature on analytical technique, very simple analytical technique—I'm a back-of-the-envelope and slide-rule man myself—very simple calculations can usually get to the heart of the thing once you've got the basic facts right.

The overwhelming problem in policy analysis, I think, is to get the basic facts right. It's not what do you do about when the Russians have a hundred and seventy-five divisions and you have twenty-five. It's digging down to the bedrock facts and getting everybody to understand that in terms of numbers of soldiers, numbers of tanks, numbers of trucks, numbers of guns, and so forth, they've got x number, we've got y number, and understanding that in fact there is approximate equality.

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With the antimissile missile, it's not getting exactly the optimum balance air defense and anti-missile defense and antimissile defense under some particular set of assumptions. The important thing is understanding that if we spent twenty billion dollars efficiently and effectively on antimissile missiles, and the Russians looking at that see their deterrent threatened, spend ten billion dollars on offensive forces to offset it, we're all back to where we started as far as lives saved is concerned, except now we've spent thirty billion dollars of this world's resources for nothing. Perhaps worse than nothing, we've exacerbated tensions, we've increased dangers, and so forth.

I think the important thing about analysis is getting the basic facts right and identifying the most important facts. That's really the problem, rather than a lot of manipulation and calculation, and so forth. Although sometimes you have to do a lot of manipulation and calculation along the way.

MOSS: Tell me a little bit about McNamara the man. What things were important to him? What made him angry, what made him happy, how did he relax? Things of this sort. [Interruption]

ENTHOVEN: Right. We're on the McNamara, what kind of man, sort of thing. I should explain that, although I think a close personal friendship and relationship built up over the years, my association with him was

professional and not social. I really can't say much about how he relaxed in those years because when we were together we were working and not relaxing.

MOSS: Right.

ENTHOVEN: Although occasionally, I suppose, on a trip or something and I'd see him relax. I think he relaxed the way any other people, by reading a good book unrelated to his work, and having an interesting conversation about some ideas that were not related to his work. Or by—I guess in fact we have pretty similar tastes—by skiing or by climbing a mountain.

I was out at Aspen [Colorado] a few weeks ago, and I was skiing and somebody was pointing out to me which were his favorite ski hills, and I was enjoying those too. I think he just relaxed the way.... I suppose it's accurate to say that, like many busy, high-powered men, his relaxation came not by just lying down and doing nothing, but rather by getting out and doing something different.

I think that, in the professional range, things that made him happy were when he saw examples of high professional competence when he saw good analysis, clear thinking, honesty. I think one of the things that made him angry and unhappy, was when he saw prejudice

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or irrationality, unreason, disloyalty. He was very strong on honesty. I remember he put in a rule that said that nobody in the Defense Department could be entertained by defense contractors, which I think is a very good rule. Somebody came to him and said, "Well what about, you know, if you're out at their plant, what about lunch?" And McNamara said, "There's no such thing as a free lunch." And I think he's right. There is no such thing as a free lunch. I think he was just exceptionally clean, honest, determined to get things done on the basis of merit and the public interest.

MOSS: I've heard it said that there was, in effect, a sort of inner club in the Defense Department that consisted of people like yourself, Hitch, Nitze, Gilpatric, McNamara; and that others were somewhat excluded from it. For instance, people like Runge [Carlisle P. Runge] and Morris [Thomas D. Morris] and so on, were not of the little coterie that ran the department. Is that fair?

ENTHOVEN: Well, no, I don't think it's fair to say that. I don't think it was a coterie in the sense of a circle at all. For one thing, in his dealings, McNamara tried to work with each man, his subordinates, in his area of competence. We never had little cabal meetings where we'd get together and plot things or something like that. You know, we'd take a particular problem; the meeting would be those people who were directly involved in that area.

I think it's the case, as is inevitably the case, that there were some people who were more, and some people who were less, on McNamara's wave length; some people who were known to have his respect and his confidence more, and others less. I think that that was

correlated with being on his wave length, and, you know, thinking about problems the way he thought about them. In fact, and I think this is probably true of Hitch and others of his key subordinates, I didn't spend an awful lot of time with him. It wasn't necessary. I mean, I'd sometimes go a week or two at a time without any direct communication, any oral communication with him, simply because everything....You know. What I was doing was what he wanted done, and he knew what I was doing. He was well informed. For one thing, there was a steady flow of memoranda from my office to his. He knew what I was doing and approved of it. But I don't think that there was....There was no self-conscious coterie or club. I never attended meeting that was made up of the inner-sanctum group of anything like that, and there just wasn't such. There were staff meetings Monday morning that were attended by the joint chiefs, the service secretaries, and the assistant secretaries of defense.

MOSS: How would he conduct a meeting?

ENTHOVEN: Oh, in a very orderly, businesslike way. We'd have an agenda. There'd be a thing we were going to get to, and he would try to get each person to address the problem,

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and he'd try to keep everybody on the tracks. He would firmly but nicely cut people off of irrelevancies, in a businesslike firm but friendly way.

You mentioned Morris, for example. I think Tom Morris was one of the people that McNamara did respect a great deal. By the way, these weren't people that were all the same either. I think that somebody who would get to know Cy Vance [Cyrus R. Vance], or Charlie Hitch, or Harold Brown, or myself would probably see certain similarities; but also I think, close up, would see quite different people, that they are made up in different ways.

MOSS: Yes. I looked up Cy Vance. He was supposed to be one of the....

ENTHOVEN: Yeah. Well, you see with Cy, he's a non-quantitative type, he's a lawyer. Although I must say he learned fast how to....He had a good nose for whether a number was likely to be fact or not. But I mean he had quite a different background from Harold Brown's or from mine, just to take two other people. It's not as if this was a little Harvard [Harvard University] or Ivy League club or something like that. I mean there were people who were drawn from all over the country with quite different backgrounds. You know, you had Charlie Hitch from Arizona and Oxford and the Rand Corporation; and you had Harold Brown from New York and Columbia [Columbia University] and physics; and you had Cy Vance, a New York lawyer; and I was from Seattle and Stanford [Stanford University] and...

MOSS: Brown was also via Livermore [Livermore Atomic Laboratory], wasn't he?

ENTHOVEN: Via Livermore, that's right. And Paul Nitze is a man with, you know, kind of Wall Street, east coast establishment kind of...

MOSS: Lovett [Robert A. Lovett], Acheson [Dean G. Acheson] crowd.

ENTHOVEN: That's right. So you had people drawn from...

MOSS: Various and diverse...

ENTHOVEN: ...quite various and diverse.... You had Elvis Stahr [Elvis Jacob Stahr, Jr.]...who was a Kentucky...I was going to say, a Kentucky Colonel, but you know, sort of a...political life...

MOSS: But I still get the impression that there were certain people like perhaps Stahr, Runge, one or two others, who didn't quite cut it, who didn't quite come up to the level of sharpness that

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McNamara was insisting on. Was it that, or was it simply a different wave length?

ENTHOVEN: Well, I don't want to comment on individuals in that particular way. But, as a general proposition, I would say there was some of both, which is not too surprising. There were some people who probably just didn't cut it on sharpness and the cutting edge of their mind. There are other people who were very good people, but on a different wavelength.

Now say, if you've got somebody like Clark Clifford [Clark M. Clifford], who is a person that I think is an excellent man. I was prepared not to like him when he first came, by the way, because he was reputed to stand for many things that I didn't stand for. But I soon learned to have very high regard for Clark Clifford who is, I think, an excellent person and, I think, deep down in many ways, like McNamara in that he's willing to be guided by facts, and getting at the basic facts, and he's honest with himself and will call a spade a spade, and he's tough-minded. But, apparently, on a rather different wavelength, comes at things in a rather different way and has a different style. Clark, of course, wasn't in that circuit, in that orbit, at all. But, I mean I could understand how somebody....Suppose Clark Clifford had been the Secretary of the Army. I could understand how perhaps they would have been on a different wavelength, just because of a different personal style.

MOSS: Okay. I'm overstaying. Is there anything you'd like to say in simply closing out this?

ENTHOVEN: No, I think that really covers it.

MOSS: Okay. All right.



[END OF SIDE II]

[END OF INTERVIEW]

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