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JOHN S. FOSTER, JR. ORAL HISTORY, INTERVIEW III

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Signed by John Foster, Jr. on February 15, 1981

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ACCESSION NUMBER 81-84

### INTERVIEW III

DATE: January 7, 1969

INTERVIEWEE: JOHN S. FOSTER

INTERVIEWER: DOROTHY PIERCE

PLACE: Dr. Foster's office, Department of Defense, Washington, D.C.

Tape 1 of 1

P: Dr. Foster, to continue our interview, we were talking about some specific research/engineering developments, and we were discussing the submarine and fleet vessels of nuclear/non-nuclear character. I wanted to ask you if recent disasters--the Scorpion, of course, comes to mind--have indicated any sort of defective planning or research?

F: No, I'm not aware that the information at this time indicates any defective planning or operations on the part of the navy. It is quite possible, however, that we may find that the loss of that sub was due to a malfunction of a particular component and in turn be able to chase that down to a failure of particular pieces within the system. However, I suspect it'll be a number of months yet before we have any more firm information.

P: There have been a number of charges in the newspaper regarding some sort of testing of the hull material that have indicated that private concerns have done a higher degree and found fault, and standards of the navy have not brought these to the surface.

F: I don't know of any validity to those charges. The experience of operating vessels at great depth is largely that of the navy. The submarine was considered worthy for sea-going operations. There is no evidence that I know of available at the moment to indicate that failure of the hull was in any way associated with the loss of the submarine.

P: You have touched briefly on the F-111 series, and I did want to ask you a question that I missed earlier. Did you make any recommendations as to the contracting of that series?

F: No, I'm sorry. I came here considerably after that contract was let.

F: Weren't they reviewing it, though, at several different times?

F: Yes, we reviewed the program but not the contract from the point of view of shifting contractors. We reviewed the program itself rather extensively two or three times a year, both for the navy and air force versions.

F: Did you have a chance to look into what the Boeing Company had issued on that original bid--the design?

F: Well, as a matter of fact I did as a consultant to Boeing before I joined the government. However, I did not participate in the government analysis and selection.

P: Have you been involved or felt any pressure regarding that series in the F-111?

F: I think everyone involved in the F-111 has had concern. Concern first that the aircraft would not perform well in its tests here in the U.S. and then over in the Southeast Asia theater, and then there has been concern over whether or not the aircraft would prove satisfactory for naval service. As you know, we have had some difficulties with the air force version of the aircraft, both here in the U.S. and overseas, though in my opinion these have not been abnormal incidents, but typical of the kind of difficulties one has with the deployment of a new aircraft. In the case of the navy, however, as you recall, the judgment of the naval officers was that this aircraft would not provide sufficient margin and flexibility over their existing aircraft to warrant its deployment in the fleet. As a consequence, the navy has decided to forego the F-111B for the near future and replace it two or three years later with a new design, which is now under way.

P: What is your assessment of the charge that there's going to be an approximate one billion dollar loss in the development of this series?

F: The F-111B charges amount to something like a quarter billion dollars, and that money was spent on the aircraft and did not give rise to an airplane for the navy. The money that was spent for avionics, that is the Phoenix Aug 9 missile system, will be transferred to the F-14, and so there is not a large loss associated with that. I think the one billion dollars estimate is incorrect, though I can't give you an exact figure. I would estimate it more in the range of a billion, certainly the number will depend heavily on just how one decides to allocate charges.

P: Do you feel that these developments are in keeping with progress in research and engineering in development of new types of equipment?

F: I'd certainly prefer to have a program with enough risk so that there's a good chance of making major gains and some significant chances of failure from time to time than to have a research program where everything was so pedantic that there was very high assurance of success. The F-111 introduced a number of major features which were incorporated into an airplane for the first time, and these features will live on in our inventory of new aircraft. Certainly the swing-wing, the capsule cockpit are two very wonderful features to have in an aircraft. I suspect the new navy aircraft will have swing-wing and I hope in the future other aircraft will have the enclosed canopy.

When one introduces major changes like that, one also comes upon surprises, and we've seen some in this aircraft. I don't think they're the kinds of surprises which should cause us to deviate from an aggressive policy in research and development in the future.

P: What surprises are you talking about?

F: The surprises of designing a new airplane using different concepts or employing new techniques usually lead one to discover aspects of the concept that one hadn't anticipated initially. As a consequence, the weight goes up or the structural rigidity is not what one thought, or the drag or the thrust is not as anticipated, and so on. One just has to work one's way around it.

P: What developments have you seen during your tenure in this office in intelligence gathering?

F: We've had a number of major improvements resulting from developments in the intelligence gathering area. Most revolutionary, I imagine, is the so-called 461 satellite. This is an outgrowth of the ill-fated Midas program, where a satellite views the earth with an infra-red detector and attempts to determine whether or not a missile has been launched. In the case of the 461 program the satellite was successful, to our knowledge, in detecting every launch that it was in a position to monitor, both in this country and over the Soviet Union. The future of that effort will be associated with the 949 program which will place the satellite in synchronous orbit, and, hence continuously in a position to monitor the Soviet Union, say, or in the case of two of them, one could be over the Soviet Union and one could be over the United States to watch for attacks on the United States by sub-launched ballistic missiles. In addition, we've had the development of the SR-71 reconnaissance aircraft which is being used in Southeast Asia and has turned out to be a very valuable source of photographic intelligence.

P: Have some of these developed directly from Vietnam? You've had a very elusive enemy there.

F: Neither of these programs were developed for the Southeast Asia conflict. However, there are a number of ferret-type aircraft that are used in Southeast Asia to constantly monitor the command control and communications in North Vietnam and into the China area in order to help our forces over there assess just what the enemy is up to.

P: Do you see that it is feasible to put up some sort of electronic barrier around the country to prevent infiltration?

F: We have experimented with a system in Southeast Asia consisting of several different parts for the different areas involved that has turned out to be rather successful. In particular we've dropped sensors that are acoustic and magnetic that have the ability to detect the passage of trucks, people on foot, and send signals indicating the presence of moving objects to aircraft that are overhead and hence then back down to the ground where this information can be collated and assessed. This turned out to be very useful to the Seventh Air Force which is in a position to plan attacks on the infiltration routes.

P: What has been the role of non-profit organizations in research and development?

F: Their role is one that is some twenty-five years old now for those that are as old as the Rand Corporation. Over that period the Rand Corporation and the fifteen to seventeen others that have grown up since that period have made some rather major contributions to the activities of the services and the Office of the Secretary of Defense.

One of the major contributions has been the dispassionate analysis of the situation as seen from the outside of the Pentagon on the future of the service. Another has been the contribution of some of the best talent to work in the problems of government and the services. I suspect that since these organizations still contain some of the very best people, since we have some of the toughest problems in the country and these organizations are working on them, that they will continue to function rather in the same pattern as they have in the past.

P: You spoke about dispassionate analysis. It's not possible for that to be done within the Defense Department?

F: I think one can do it. The difficulty, however, is that in the DOD, the talent necessary to do that kind of analysis on relatively long-term study projects is also exposed to the tremendous tendency for such individuals to be gathered up in the fire brigade that's used to take care of this or that problem of the moment.

P; Do you feel that there is really a military industrial complex? And what is your assessment?

F: I know there's a military industrial complex and it's a good thing. I believe that in our society, the maintenance of military capability to provide for our freedom demands that we have those who will speak for it. And the military services and the industrial organizations that provide for their equipment do speak, and they're heard. I believe also, however, that the government is fully capable of managing both the services and the industrial organizations.

P: Could you give me the Department of Defense relationship and in particular your office to the Office of Science and Technology run by Dr. Donald Hornig?

F: Certainly. Dr. Hornig and I contact each other once or twice a week usually, and are quite familiar with the activities that each of us has under way related to national security. In this case, of course, it involves all of my activities, but in the case of Dr. Hornig it's only a portion of the kinds of things he worries about. We each have advisory committees--scientific groups--to help us. In the case of Dr. Hornig it is the President's Science Advisory Committee and in the case of the Department of Defense, it is the Defense Science Board. I coordinate with Dr. Hornig on the selection of key problems for study and then we decide which group is most suitable for attacking the problem. From time to time, the White House has concern over this or that aspect of research and development in national security and Dr. Hornig will give me a call and we will do what we

can to allay the concern. I think, all in all, it's a pretty good arrangement, both for the White House and the Department of Defense.

P: During your three years here, Dr. Foster, are there some particular areas that the White House has given you directions to pursue?

F: No. We haven't to my knowledge received any instructions or directions from the White House. We frequently receive questions. Questions with regard to, for example, travel of foreign scientists in this country, and whether or not the access areas are sufficiently large, and whether or not one couldn't possibly arrange to have foreign visitors travel to or in certain areas, things of that nature. And usually one can go quite a way to accommodate whatever interest they have.

P: Have there been any applications of defense research and engineering to urban and industrial problems?

F: Yes, there have been quite a number. In fact, that whole area is being intensely examined and followed as a result of Secretary Clifford's national and industrial security forum talk some months back.

In particular, for example, there is the research and development on advanced housing. Here, because the Department of Defense builds thousands of homes for service people each year, the Department of Defense is in a position to construct houses of novel design without some of the restrictions of the various building codes. Consequently, we have under way a program which is jointly sponsored by the Housing and Urban Development Agency. This will provide housing for homes in the next two years where servicemen can live and over the next three or four years evaluate these homes from the point of view of utility, wear and so on. If they turn out to be quite satisfactory from that point of view, and at the same time on review by the civil authorities, they find that the modifications that have been made in the construction are adequate from the point of view of building codes or suitable modifications to the codes, then hopefully one would be able to build suitable homes in the civilian sector at reduced prices.

Another example would be the progress through research in the medical area and of course the war in Vietnam provided the opportunity for great progress in that area. The spinoffs in the treatments of wounds, burns, sprains, fractures and so on that occur in wartime and their treatment supplies a constant flow of improved procedures and equipment to the civilian sector.

P: Along the same line, Dr. Foster, has there been any contribution towards stopping or quelling civil disturbances?

F: We have made a start in that area. There is of course tear gases, and there are some techniques for communication that are being used that result from the military equipment developments. However, the newer efforts have yet to come to fruition. This is an



important area and we're beginning to follow it with more intensity than we have in the past.

P: Anything along the lines of detecting weapons?

F: Yes, we've got three different programs under way there which I think will be of limited value. I don't see any way to provide foolproof surveillance over the individual who wants to take a potshot from a large crowd at a key figure.

F: In terms of the research that we have done so far, have we laid a firm ground for future development of weapons systems?

F: Well, until one sees just what weapons systems are required, one can't be sure that one has done the necessary background research in the earlier years. We make an effort, however, to see that the technological base that we do support is sufficiently broad that it covers most of the areas that at any one time seem to be promising.

Currently this basic research and exploratory research area involves a total effort of about 1.4 billion dollars each year. That covers tens of thousands of different kinds of activities. So one would think that it's quite likely that any new weapons system that comes along could dip into this vast area of basic and applied exploratory research and find adequate development to be able to cope with the problems. But in fact it turns out that even though we have done a large effort in a particular area that is naturally suited to a weapons system, when we actually pursue the weapons system we then find still a host of problems that in turn need to have various kinds of applied research effort in order to be able to overcome them.

P: What new or what advanced research projects in developments of new weapons can we expect in the future?

F: That's hard to say. Depends very much on the threat. Certainly the emerging Chinese missile, aircraft and submarine programs will force us to maintain a vigorous effort in the anti-ballistic missile field. I believe we will be forced to maintain some advances in the aircraft defense and of course we will have to maintain a very vigorous anti-submarine warfare program.

With respect to the Soviet Union, I think we cannot plan on having some detente with the Soviets that will remove requirement for advanced researches. I suspect we will have to maintain our guard in that area. As a consequence, I think the need will continue for advancement in the Polaris/Poseidon type of submarine. For that reason of course we have a new underwater launched missiles systems called ULMS that is being initiated. We also have some programs under way that could culminate with the development of a new missile to follow on or replace the Minuteman. Finally, as you know, we have just recently laid plans to initiate the first phases of the development of an advanced manned strategic bomber to replace the B-52.

P: What is under consideration now that appears to be in the present light most far-out, most unexpected? This is strictly from the point of interest, not in the technical sense.

F: One possible candidate might be the ability to be able to have a re-entry vehicle come into the atmosphere and then maneuver with such extreme motion that it is not possible to intercept it. It is one development item which has been under way for several years. When this comes to fruition, which will be in the next two or three years, it may be viewed by many as a kind of ultimate in the ballistic missile offense side of strategic weapons. As I've indicated, I think the idea of having a satellite in synchronous orbit viewing the earth at all times, being able to tell the U.S. president just when a missile is launched from, say, China or the Soviet Union, just which silo it came from, what its probable payload is, what its destination will be, about what time it will arrive and probably what a ballistic missile defense system will see, is a contribution to the intelligence community that far exceeds in accuracy and detail the kind of intelligence people have had historically in the past.

P: Do you think there will be a continuation in the development of chemical warfare?

F: Yes, I think there will be. However, the problem with chemical and biological warfare is that it is not really as controllable as other weapons. The agent is given to the winds and the course is then up to the will of the winds instead of the will of the commander. We had difficulty, as you know, in World War I with that particular kind of a weapon and I suspect just from that basic problem will persist.

P: What is your assessment of the charges by numbers of our scientists that the defoliants used in Vietnam have really upset a biological cycle?

F: The charge is true. The use of defoliants have upset the biological situation and the cycle in those areas in which they've been used. However, the disturbance is, as far as we can see, relatively minor when one views the whole countryside, and in some cases this minor disturbance seems to be a benefit in the sense that when the leaves are not there other foliage and fauna have a chance to grow when they were not able to grow before. In other cases, it seems to have a negative influence in that it upsets the soil balance, so that some species tend not to grow at all. So it changes some for better and some for worse, but doesn't make much of a change in the average.

P: Is it returnable to its former state?

F: It seems to be. There seems to be, as far as we can see, no permanent damage.

P: Dr. Foster, you've served under two secretaries of defense. How would you compare these men in their style, their pace, their decision-making, their attitudes toward research and engineering?

F: I don't find them very different from the way the reader would find them from reading the newspapers. They're both extremely able men who have made the decision to serve the President of the United States and they've both done an extremely good job. They do it

differently. Mr. McNamara tends to look in great detail in particular into the technical aspects. Mr. Clifford seems to have great insight into the way people will behave. Neither one of them tends to ignore the other aspect, although they do tend to concentrate on different aspects.

P: What has been their response to research and engineering?

F: Each of them has gone ahead without any hesitation on any development program where I felt we would make a clean argument for its necessity. Where it has been difficult to make a good case, it has been difficult to convince either one of them, and I think that's just the way it should be.

P: There've been charges that due to Mr. McNamara's changes and reorganizations in Defense it has become over-staffed and over-centralized. What is your assessment of this?

F: I think the large number of very able people in the Department of Defense does tend to result in an accumulation of a lot of decisions in the Department of Defense. Perhaps in their own defense, the services found it necessary to acquire large numbers of people at their higher echelons. Frankly, I suspect there is a good chance that over the next two or three years that we may be able to redress this situation and put more of the responsibility for decision processes back in the services now that the services also have picked up the management techniques that were used in OSD and effectively operate their programs in that same way.

P: Would that be for the best now?

F: I think it would be, yes.

P: During your time here, since 1965, on what occasions, let me specify major occasions, have you been called to testify before Congress, and what were the issues, subjects?

F: Each year in the spring I am called by the Congress to go and testify, usually just after the Secretary of Defense. And I follow the same committee hearings as does the Secretary of Defense; then usually go to a number of subcommittees. Each year this amounts to something like twenty or thirty hours of testimony before something like a half a dozen different committees. Occasionally, the Secretary of Defense or one of the service secretaries or perhaps the Chairman of the Joint Chiefs will ask that I accompany them, because of some particular matter that may come up. Other than that I usually go just to present the research and development program that has been introduced by the Secretary of Defense.

P., Have you been called on to defend any particular program as a result of expenditures or failures in it?

F: Yes, any program in research and development that is of particular interest to any of the congressional committees generally is covered in rather great detail when I appear.

P: Do three or four of these come to your mind--the strongest ones?

F: We've had a number of sessions on the F-111, on the F-12 air defense issue, on the question of the U.S. submarine development, on the matter of the main battle tank, the need for a new fighter aircraft to replace the F-4, on the U.S. ground air defense system--the SAM-D, on the defense of surface ships against cruise missiles, on the need for improved air-to-air missiles, on the use of electronic countermeasures to reduce the effectiveness of the Soviet SA-2 missiles, and so on and so on.

P: Have you felt on any occasion that you were having a hard time communicating with the committees?

F: Every time the committee makes a decision that goes against the Department of Defense in the area of research and development, I decide I've had a hard time communicating to them.

P: What is your assessment of the relations between the Pentagon and Congress of the last three or four years?

F: I think the relationships between the Pentagon and the Congress over the last two or three years have first grown a little more difficult and then more recently grown considerably better. But I suspect this is kind of a seasonal variation and I look forward to a rather hectic situation this spring from a number of the committees.

P: Have any of these sessions or the deterioration of any of your relations made your work more difficult--progress in research and engineering?

F: Certainly when one fails to communicate with the Congress, the Department of Defense then is not granted the funds to do a particular program. That does indeed make our work more difficult.

P: What do you consider your worst failure in this area?

F: Quite frankly, I don't think I have any specific failures. The most discouraging development was a decision by the Congress to curtail the expenditures for fiscal 1969. That in turn led to a reduction of the research and development program of about one half billion dollars out of eight billion. That was a very severe reduction.

P: Have you ever been interviewed before for any sort of history program such as this?

F: No, I haven't.

P: In any of your writings, which are numerous, do you feel there is any need for any clarification, changes, or additions to anything?

F: No, I don't think so, I think you've covered it very well.

P: Do you have any further comments?

F: No.

P: Thank you very much, Dr. Foster.

F: You're very welcome.

[End of Tape 1 of 1 and Interview III]