INTERVIEW II

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INTERVIEWEE: JOHN S. FOSTER, JR.

INTERVIEWER: DOROTHY PIERCE

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

Tape 1 of 1

P: Dr. Foster, I would like to pick up from the point where we left off. In light of the controversy over the deployment of anti-ballistic missiles systems in this country both in terms of escalating the nuclear powers or in fully defending our country, what do you think our posture should be on an ABM system?

F: I think that the posture that we currently have is the right one under the circumstances, the circumstances being a very heavy Soviet capability and an emerging Chinese nuclear capability. The current plan, as you know, is to deploy a ballistic missile defense that is described as thin, though it represents the very best that we have available in the way of technology. It can provide us with a very high assurance in the mid-seventies of no casualties from a Chinese attack by ICBMs. It will provide us, also, with an opportunity to defend ourselves against an accidental launch of an ICBM from any country and in addition the option to defend our Minuteman sites should we find that the Soviet Union is developing a larger number of accurate missiles.

The reason I think the current approach is right is simply on two grounds. First of all, I believe it is to our advantage to be able to preserve the asymmetry that we have had with respect to China. I think in the next decade if the Chinese were to get ICBMs they would be in a position to deter us as we in the past have been able to deter them, only it would no longer be unilateral. We'd be able to deter each other, in a sense. I think with the possession of ICBMs they would be in a position to have a rather profound effect on the activities that the President might like to undertake in the area of Southeast Asia. In the same way, I think we ought to try and preserve the symmetry with respect to the Soviet Union. The Soviet decision to deploy ballistic missile defense has made an apparent asymmetry and I think we can restore that.

However, there is still another factor, and that is that over the next decade we can't be sure just how much technology has in store. It has changed a lot in the last ten years; in fact, it has changed enormously. And over the next ten years I suspect there's a good chance it will change a great deal. Therefore, I think we should try and get a leg up. Now, that's what I believe is behind Secretary McNamara's and Secretary Clifford's position on this. They generally agree on it. I think we're going in the right direction. I don't believe

that one could just increase the number of units that we plan to deploy by a factor of four or ten or forty in order to get heavier and heavier coverage. I believe rather if we were to wait for four or five years we would find that at that time instead of deploying additional units, we merely change the units we deploy, take advantage of the research and development during that four-year period we would be deploying systems that were at least twice as effective and, hence, I believe that the same number of units with time will provide at least as good protection against the threat as double the number of older units. Therefore, rather than making it heavier I think it's preferable to keep it thin and advanced. Now, you can't have a very, very large number of units always advanced. That kind of turnover in the inventory just isn't economically possible for us.

P: The obsolescence of it makes it wasteful economically, doesn't it?

F: That's right. Technologically, it just becomes obsolescent rather rapidly.

P: The changes you spoke of, were you looking toward space?

F: No, these are advancements in radar for certain, major advancements in missiles and advancements in the warhead. Now, I agree that there are some major advancements that can take place in space. And one of them has to do with an item we discussed the other day, the possibility of being able to detect from a space satellite the launch of an ICBM from anywhere on earth and to be able to predict approximately where it will land. That's a major asset to the ballistic missile defense system. There may be some other advances there and we're currently probing for them. One would be to be able to tell something about the nature of the object that was in flight, to be able to discriminate the real object with the warhead from other objects, such as pieces of chaff or metal decoys and so on.

P: While we're on this area of space, do you think in terms of what you've just said the military should have a larger role in space?

F: Space is just a place. If it turns out that the use of space for military purposes requires men or equipment up there, I believe the men and or equipment should be up there. If, however, we cannot see any need for military men being up in space from a point of view of serving military purposes, then I don't see any reason for putting them up there. The DOD policy has been formulated strictly on the basis of usefulness of carrying out the military missions.

In an attempt to find out simply by looking whether or not military men can perform a useful military mission in space, we have, as you know, military men serving as astronauts. In addition, we have the manned orbiting laboratory program. So both the NASA space program and the MDL [Manned Orbiting Laboratory] program are manned by military people. Through those two programs I think we will have an adequate opportunity to find out whether or not space offers opportunity to do the current military missions better or offers new military missions of importance.

P: Does this asymmetry, a word that you use, come into question in terms of say Russia getting a leg up on us in orbiting something like this in space? Doesn't that portend a great security threat?

F: I think it certainly is a psychological threat. While I don't feel particularly disturbed when the Soviets orbit an object, other than from the point of view of curiosity, and my friends don't get disturbed, I find that non-technical people generally are profoundly disturbed. I found a number of the members of the Congress that are very disturbed by information concerning Soviet activity in space where there is no U.S. counterpart. The examples that come readily to mind, of course, are the FOBS, the Fractional Orbit Bombardment System and the hundred megaton warhead. These are items where the United States in fact examined the possibilities, examined these two particular possibilities in rather great depth, and I would say historically it's quite likely the United States examined those possibilities before the Soviet Union did, and made a decision not to go ahead, because we did not believe that they offered any particular military advantage. I think the United States' decision was correct.

P: And what about a defense against this?

F: The defense against a hundred megaton warhead, as a matter of fact, turns out to be a lot easier than the defense against a one megaton warhead, let's say, on an ICBM. The reason is very simple. The difficulty in defending against incoming ICBMs is primarily tied up with problems of confusion--hiding the re-entry vehicle in chaff or decoys and so on--and secondly, coping with large number--large numbers of warheads or large numbers of warheads and decoys. The problem with the hundred megaton warhead is that it's a very large object. And it is very, very difficult to decoy without putting in very, very large decoys and larger numbers of things. Of course, because it's such a large object, it takes a very, very large booster. That makes it very expensive and so one will not likely have a large number of them. Therefore, it’s the easier thing for the defense to take on. And next, of course, from the point of view of the offense, there are very few targets that warrant the use of a hundred megatons. So from that point of view, because it's a very expensive weapons system, it's not likely to be built.

Turning to the Fractional Orbit Bombardment System, I think one might think of that as a form of penetration aid. It's a penetration aid in the sense that it could be fired the other way around and come in from the South, avoid the BMEWS [Ballistic Missile Early Warning System] and perhaps catch our bombers unaware and still on the ground, and hence destroy them. The reason we are not particularly concerned about that is that we already have, as you know, an over-the-horizon radar system that detects the launch of Soviet missiles. I wouldn't expect the system to trigger off any major launching if a single mission was launched, because we would not be able to tell that single launch from a space experiment. However, in order to be effective against our B-52s they would have to launch not one or two or ten but dozens. I'm sure as soon as a few of them were launched, our B-52s would be alerted and off the ground long before the missile arrived. Of course, if it were in a southerly direction, we would become rather suspicious early because it would

not appear over the United States until a half hour later than it would normally be expected to appear.

The direct firing of the FOBS over the North Pole to the U.S. does provide some advantage from the point of view of penetrating ballistic missile defense. This advantage comes from the fact that the FOBS flies at a very low altitude, about hundred miles as opposed to six or eight hundred miles. That makes it more difficult for the radars to pick up early. If it flies at high altitude as is normal in an ICBM trajectory one would pick it up at fifteen hundred miles. With the low altitude trajectory one would be hard placed to detect it to more than four or five hundred miles out. As a consequence there would be very little time to launch interceptors and cope with that missile. Interceptors like the Sprint certainly have adequate time to cope with it, though they are shorter range. However, the enemy has paid quite a price because he has to drop off about two-thirds of the payload in order to be able to get this FOBS capability.

F: So all of this, in other words, lowers your--

F: Lowers my confidence that this is a worthwhile system to build. You see, we have to first be able to cope with a SS-9 and SS-11s in their normal trajectory, and there are just hundreds of those. If there are a few devoted to this particular feature, what we have to make sure of is that they do not destroy our ability to provide assured destruction of the Soviet Union. Perhaps the most worrisome point is the B-52s. And we have provided for the assurance of that through the over-the-horizon radar and then starting in 1970 the space-based 949 missile detector that will give us warning within three or four minutes of the time the missile is first launched by the Soviet Union. So we'll have two independent systems that will tell us of launches.

P: Let me depart just a minute and ask you sort of a philosophical question here. You're a scientist and you speak in terms of assured destruction of Russia. Do you have to work in terms of all of your thinking having to cope with this?

F: All of the thinking associated with the strategic aspects of military weapons systems. The difficult part is one that involves a certain amount of judgment, that is, how much assurance. If you say assured destruction, it means that you have to be assured that given the range of possibilities that might develop prior to an all-out exchange that we can have the necessary confidence, we can have the assurance of that kind of destruction. So it's actually more a question of making sure that you'll really be able to deliver what you've decided is needed to be delivered rather than deciding how much needs to be delivered. The normal number is something like four hundred megatons on the urban industrial complex. That would, as Mr. McNamara has said, provide for the destruction of the Soviet Union as a twentieth century nation. There is the question then as to whether or not that really is assured destruction. Is that sure to destroy the Soviet Union? A few million people in Russia would survive. But that's not the point. The point is whether or not it really would survive as a world power. I think it rather likely that it wouldn't. At least, it would be a few decades before it would again be considered a world power. Likely, in fact, it would be under other domination.

P: You look in terms of this as being strategic, I am aware, but in our scientific pride can we carry this too far?

F: I don't think it's much a matter of pride. We have a scientific pride, all right, but we also admit at the same time that the Soviet Union has an assured destruction capability of the United States, even though we believe we're technically superior to the Soviet Union. It's just the nature of the weapons systems that have evolved.

P: While we're on these high-powered weapons systems, where do you think the emphasis should be in terms of the nuclear and non-nuclear mix in order to achieve a credible deterrent?

F: Well, that's kind of a complex issue. I think with respect to the strategic systems and the deterrence of the Soviet Union, there isn't any alternative there. We just have to have that deterrence and it has to be credible. Not how much we think is enough, it's how much we can be quite sure he thinks is enough. Now there are people in this country who think that a certain number of weapons is more than enough, it's way overkill, and there'll be others who think it nowhere near enough. What really counts is that we have enough so that most of the people, hopefully those making decisions in the Soviet Union, would be utterly convinced that they would face destruction if they attacked the United States and had to accept what, in their opinion, would come back.

Now that has to be done by nuclear weapon. The more or less tactical or non-strategic weapons systems involve both nuclear and non-nuclear. Whether or not you are driven to nuclear weapons depends in part on how well you can cope with the situation using conventional or non-nuclear weapons. I believe that it's necessary for the United States to develop adequate non-nuclear tactical capability and that our allies are so equipped, in order to provide the assurance that if the Soviets chose to escalate, we can cope with them. In other words, we should not be in a position where if they chose to escalate we can't go one measure higher without resorting to nuclear weapons. We don't want to have to be faced with the onus of using nuclear weapons in order to be able to win a non-nuclear combat.

P: I'd like to ask you some questions here on what effects the Vietnam conflict has had on research and development, in terms of what is directly attributable to the demands that have come from the situation in Southeast Asia.

F: There are a whole host of research and development items. As I think I indicated to you last time, we had in 1965 a few tens of millions of dollars devoted specifically to the Vietnam War. Today the number is close to a billion dollars. Initially the problem was, at least a major problem was, to find the enemy. Today we can find the enemy. We can find him because we have been able to develop a weapons system that will defoliate suspect areas. We can then see through to the ground. We can see trails, we can see houses, and so on. The enemy then, of course, moved at night, and we were blind. Inside of the last two

years we have designed, produced and fielded into the area a whole series of night vision devices. So now we can see at night.

In addition to that, we've had difficulty when we found the target, hitting it. We've had hundreds of aircrafts, hundreds of thousands of sorties, very meager results. So the problem of hitting the target once you've found it has been acute. However, as you know, we've recently developed a series of weapons that permit us to get incredible accuracies, as compared with normal aircraft delivery systems. Instead of having accuracies of hundreds of feet, we now talk in terms of say ten feet. Now in terms of the numbers of munitions and aircraft to kill a given target, you roughly take the ratio of those numbers and square it. So you can see it makes a hundred to a thousand-fold difference in the number of missions or the number of munitions you have to drop in order to destroy the target. So it makes all the difference against small targets. Against area targets, like people distributed in a field, of course, we will have to rely on the dropping of area-type munitions. But here again we have made a major improvement. I would imagine it's about a factor of tenfold reduction in the cost to successfully attack troops in the open, and this is a consequence of the development of these little bomblets. A package dropped from airplanes that looks like a few hundred-pound bomb separates into hundreds of individual bomblets that disperse out and kill over large areas.

We've also, of course, as you know, had the further development of the helicopter, which has turned out to be extremely effective, not only in the day but also at night, to transport our troops and to support them in combat. We've had some major improvements in armor, especially the ceramic armor which is now much lighter and still more effective than the older steel types. We've got some major improvements in command control where we can now talk to our troops who are patrolling over much larger areas. We've got satellite communications that permit us to transmit very high quality photographs from the theater back to this country, so that we can see with high resolution the details that the people in the theater are looking at essentially at the same time they're doing it.

So we've really put into the field a number of new weapons systems. In a way one could view the First Cavalry Division as an experimental division, it went over there with helicopters and an experimental array of night vision equipment, guns on helicopters, and a new concept in combat. That has turned out to be enormously successful in coping with a war where other nations in the past have failed. We fielded a new kind of weapons system on the task force that operated in the Tonkin Gulf, a new kind of carrier, nuclear propelled, new jet aircraft never used before in combat, new weapons systems on those, new command control, the whole system brand new. As you see, it has been tested in combat for several years and performed extremely well.

We've got a space system, a system of satellites that can provide for communication and can provide weather information. The commander in the theater, once he has sent off his troops, can see the weather evolve as the aircraft go to their target area and see it in a way that he just could not possibly see it without the use of weather satellites. Of course the communications from this country to Southeast Asia by means of satellite afford a kind of reliability and quality that's just unmatched by any other transmission system.

P: Has the problem ever occurred where it has been directly charged to you from, say, something like the White House having heard of it from the field, to solve this problem, such as the accuracy of targets?

F: There have frequently been a number of requests from the White House to look into this matter or that. I know of none that have come that were requests to initiate activities that were not already under way.

P: All of these things that you have named fall within the category of being non-nuclear deterrents.

F: That's right. The best way to deter nuclear war is not only to have a good nuclear deterrent, but to be able to deter activity lower than an all-out or partial nuclear exchange.

P: Did we need a war to come to this level of preparedness in this area?

F: I think that's a very difficult question to answer. It's quite certain that we would not have had levels of expenditures above 80 billion dollars in 1968 had there not been a war in Southeast Asia. However, this state of preparedness is not a consequence of dropping thousands of tons of explosives. I think it's a consequence of having tried to do a job and found we couldn't do it very well. I think we could get this state of preparedness with far less than the current budgetary level. However, I'm not sure whether or not one could get this capability in fact without having to have some kind of conflict.

P: In this area does this put us--sort of coldly put--with the practice we've had ahead of Russia?

F: Unquestionably we're ahead of Russia in a number of areas. However, they've had some practice, too, and they make it their business to practice, and even if it costs a fair amount of money, even if it costs a fair amount of inconvenience in their country and in other countries. So I think there's no question but what we hold a decided advantage in a number of items that are being deployed over their counterparts in the Soviet Union. However, there are a number of areas where they hold an advantage. If the war were fought on the conditions where their particular weapons were of critical importance that could be a decisive factor.

P: I'd like to discuss with you some specific research and engineering developments over the last few years that have had little controversial problems. Do you feel that the F-111 program has been successful and will be kept?

F: Well, the F-111 program was well under way, in fact had been under way about five years by the time I arrived. I recall in my first session before Congress this was a particularly hot issue. I told them I wasn't very familiar with it, but I would look into the program and if it looked like it wasn't going to be a satisfactory airplane, I would see that it was fixed and tested and fixed and tested until it was satisfactory, or I would not support the deployment.

And I did that. Now, as you know, subsequently the navy decided that they did not want an airplane with the characteristics of the F-111B. I believe that the F-111B would have performed the major missions, the prime mission, for which the aircraft was requested. I agree that it would not have performed some of the alternate missions as well as an airplane that we could build today. As you know, subsequently the Congress denied the funds for the F-111B and placed monies in the fiscal 1969 budget so that the Navy could go ahead with the development of a replacement aircraft. They're proceeding as planned and there's no question in my mind but what if that airplane is developed along the lines that are now laid out it will be a superior airplane to the F-111B. Of course, in time even this newer aircraft called the F-14A will be replaced by another aircraft that is still superior to it.

P: And will this phase out totally or--

F: This will mean that the Navy will not have any F-111 series in its inventory. However, the air force will have in its inventory some F-111As and then a newer version with more advanced avionics, the F-111D, and then the "RECCE" [Reconnaissance].aircrafts, so called RF-111s, and finally a strategic bomber version, the FB-111.

P: In terms of its use in the air force, do you consider it has been and will continue to be a successful program?

F: Yes, I think it will be a very successful aircraft.

P: How far do you think the manned bomber program will be carried?

F: I simply don't know. I suspect that we'll move along for the next two or three years, examining in engineering detail the kind of a bomber that could replace the B-52. If at that time the Soviet Union appears to pose a still greater threat to our strategic forces and if at that time it is believed by the administration that they would like to have bombers as part of our strategic deterrent, then I believe the situation would be such that people will decide that the B-52s should not be continued indefinitely, and one should go and build a new advance bomber. However, what the characteristics will be and whether or not this kind of thing will in fact evolve is sheer speculation.

P: How do you feel about it?

F: I think moving toward a new bomber along those lines with these check points and conditions is the right way to do it.

P: We are well into a program on an advanced bomber, aren't we?

F: No, I wouldn't say we're well along. What we have carried for several years now is a program in advanced engines and advanced avionics with more recently some special attention to bomber defense missiles and special penetration aids. We have not given anything like the attention to the integration and engineering detail that is contemplated in the next two years.

P: What is AMSA?

F: Advanced Manned Strategic Aircraft.

P: Isn't that a forward-looking manned bomber?

F: Yes, it certainly is, but you can't have a forward-looking manned bomber until you get a new kind of engine and a new kind of avionics and so on and so on. So we are advancing the state of the art in engines and in radar and in computers and in defensive missiles and penetration aids and so on. Then when we get enough progress in each of these areas we can pull them all together. If the whole system looks like an advanced manned strategic aircraft and the threat really needs one, then we'd go,

P: What sort of pressures from the air force and from industrial contractors do you have to pursue this?

F; I don't sense any very great pressure. I imagine that some years back there was probably quite a bit of pressure. In the last several years General McConnell and his officers have been looking at this very seriously, trying to understand clearly just what kind of a bomber they want, just what they'd like to have on it. I think they've reached the stage where the procedure that we've got in mind is just about the right thing to do.

P: Where do you think the emphasis should be in nuclear and non-nuclear fleet?

F; This from the point of view of surface vessels and submarines? I think they are two quite separate things. The use of a nuclear reactor as the propulsion source in a submarine is mandatory for survival. Without the use of nuclear power one is forced to come to the surface to recharge batteries. With nuclear power, as you know, one can go around the world or stay down for months at a time without ever surfacing. And because the sea is about as difficult a medium as the jungle is in South Vietnam it provides a great seclusion for a vehicle as large as a submarine. Since most of the earth is covered with ocean, submarines can stay five hundred to fifteen hundred feet below the surface, and it will probably be some time before there is any very serious risk to their survival , provided they have the freedom of whole areas of the sea.

In the case of the surface fleet, I think this is more one of vessel size and economics than it is of military flexibility. It's true that the nuclear power gives you unlimited range and one does not have to plan for an oiler or a tanker to come up alongside to supply additional fuel. However, the difficulty is that most fighting ships have to receive supplies on a weekly or monthly basis, so while they are taking on more ammunition or more aircraft or more bombs, they can also be taking on fuel. The economic question of course is simply turbine power. As a consequence I suspect the nuclear power will be used generally in our larger ships and not in the smaller ships. And the debate usually rages over the break point: for ships as large as carriers, it seems like a good idea; for ships as small as destroyers, it's quite marginal.

P: How would you assess the impact of Admiral Rickover on the atomic powered submarines?

F: I think he's had a major impact. He has done a magnificent job. He certainly turns out very reliable power plants, has a particular way of doing it and is very tenacious. My prime difficulty in that particular area has been actually trying to get the rest of the Navy to do as creditable a job in their area as he does in his. Most of the pleas for new submarines are associated with improvements in the propulsion plant, and I think in the future we are going to be making improvements in a number of other important areas.

[End of Tape 1 of 1 and Interview II]

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