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## Interview: Thomas O. Paine

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# 'We need a much stronger, more vigorous NASA'

*Dr. Thomas O. Paine was the head of the recent National Commission on Space. The Commission report, released on May 23, recommended a bold plan for the United States, including a manned return to the Moon by the year 2005, and a manned Mars landing by 2015.*

*Dr. Paine was the administrator of the National Aeronautics and Space Administration at the time of the first Apollo landing in July 1969, the president of Northrop Corporation 1976-82, and is currently the president of Thomas Paine Associates.*

*Dr. Paine was interviewed by Marsha Freeman.*

**EIR:** Do you think that the Commission report will be able to influence policy decisions in Washington now, in this situation of budget constraint?

**Paine:** I think the report has a very difficult lifetime to get through. Reports of the type we have just produced, have a fairly standard reception. That is, the day they're written, they are called a "rosy view of the future"; they're called "much too far out"; "Oh, my God, those things could never be achieved." But I think if we were to be reviewing our report 10 or 15 years from now, we would probably be getting the opposite criticism—"they failed to foresee a lot of these new things that have been coming along; the report is obsolete, it didn't go far enough." In writing a report like this, you have to face the fact that you're probably not going to be bold enough in the long run, but you're probably going to be too bold in the short run.

**EIR:** I have here a short quote, from Joseph Loftus from the Johnson Space Center. "What's been achieved in space is extraordinary. If you laid out a proposal to do in the next 25 years what has been done in the past 25 years, no one would believe you."

**Paine:** You're reading my favorite quote. I thought that was a terrific observation, and it's true. If we had said in the space commission report, that eight years from now we were going to land people on the Moon, we would have been laughed out of Washington, yet that is precisely what we said in 1962, and it's precisely what we did! In many ways, if we were to propose today to do what we've done for the last 25 years, today's America, today's Washington leadership, in many ways, would say, "Oh, that's much too bold. You could never do that." Yet the fact of the matter is, we've done it. And I've had people tell me, "Let me see those pictures of

astronauts riding on the Moon in a vehicle. I can hardly believe it." Well, they've forgotten that that was all done, 16, 17 years ago.

**EIR:** At *EIR* we have recently taken a look at launch requirements up to the mid-1990s, taking a look at the construction of the space station, the testing and deployment of the Strategic Defense Initiative, and the other defense and science payloads. Our finding was that eight Shuttle-equivalent payload carriers would be needed by that time.

**Paine:** I think that's right. It is quite a formidable launch requirement that we face. I think my second comment would be that you are only looking at things that are visible from 1986. It may be that if you took another look at 1992 or 1994, there will be things that would have come over the horizon by that time, and I don't think there will be anything much that will reduce those estimates of yours, so we really are in a bind. At the same time, I think it's fair to say that because we have neglected to develop the new technologies that the nation needs to design the next generation launch systems—we've really had 10 years of neglect of advanced rocket propulsion technology development in this country—we simply can't jump immediately in and start designing the post-Shuttle system now. It's going to take us a good five years of intensive technology development, and that means that you can't be sitting around debating Gramm-Rudman. You've got to get some engineers working on some new technology, whether the lawyers and economists are ready or not. If we're going to be developing post-Shuttle transportation by the end of the century, we've got to get started on that technology today. And that's a very important point. Because of 10 years of neglect, it's even more critical than ever.

**EIR:** One question about the Rogers Commission, which is investigating the Space Shuttle Challenger accident. You were not the head of NASA during the 1967 Apollo fire investigation. . . .

**Paine:** I was administrator when we investigated the Apollo 13 accident, but we didn't lose any lives in that. . . .

**EIR:** I see a danger that there will be many things recommended in their report that will be difficult, if not impossible to comply with, such as requiring that the system have no "criticality 1" items, which could lead to the loss of the orbiter

and crew. You would have to have redundancy for everything. I'm sure that in the Apollo system there must have been many items where the system simply had to work. What is your idea on how any commission recommendation should be implemented?

**Paine:** You're getting into the area where I think engineering trade-off decisions have to be made. As you start loading redundancy and safety factors into equipment, you reach a point where you're not really increasing the reliability or safety after a while, because you start getting the failures of all the safety systems that shut down engines when they really shouldn't be shut down, and it's really a technical, engineering decision as to what is the optimum balance. And there are, as you point out, areas where you simply cannot have redundancy.

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When we sent the Apollo spacecraft out to the Moon, we had one rocket engine to bring them back. We just couldn't load two on there; it would not have been possible to carry out the mission. What you try to do then, is when you only have one, you have to make darn sure that you are building the absolute maximum amount of reliability into it, and then you test and test and test and test. It's perfectly feasible to do this. We have demonstrated it time and again. We fly something like 70 million people back and forth across the Atlantic Ocean every year, and the only time we ever dump anybody in the drink is when a terrorist puts a bomb on board.

We can design space systems that are both inexpensive, and very safe and reliable to fly, and its time we got at it. But I think one of the fundamental problems is that you can't do it on too low a budget. I think when we cut NASA from the peak of Apollo down to the present size, we cut it to one third of what it was, we cut too deeply. Unfortunately, the administrators of NASA at the time, anxious to keep a bold program going, probably accepted too great a commitment. They overpromised, they came out with commitments that couldn't be met, and the net result was a budget crunch; and then they had to take some shortcuts and some economies, that now, with all the benefit of hindsight, any "Monday morning quarterback" can say, "We cut too deep, we didn't really spend

enough. We should have put more emphasis in there on safety."

**EIR:** I see a danger of that happening with the current space station program. . . .

**Paine:** I think there's a real danger of it happening. I think the space station program at the present time is going right down the Shuttle road. Namely, you start out with a sum of money, and you say, "OK, we're going to build it for eight billion dollars." Then as time goes on, you run into difficulties, you don't get any increases . . . that would be an overrun . . . we can't have an overrun. I think that's the wrong way to fund these advanced projects, where you really don't know all the things you're going to be getting into. I think it's much better to fund them on an annual operating cost, and then go ahead and deploy the thing when you're satisfied you're finished, and it's ready.

**EIR:** It's the difference between having a mission orientation, and an annual budget-cycle orientation.

**Paine:** Yes. We need a much stronger, more vigorous NASA that's moving out into the future as rapidly as it can, with a budget which the nation can afford. And then let the variable be how soon you're ready to deploy these things, but make sure you're spending enough money on it, and if it then turns out to cost \$10 billion instead of \$8 billion, well, spend the 10, don't try to cut back and make the system marginal. There's one other thing, too, I think you have to be careful of, and that is to recognize that NASA is supposed to be pushing the limits of technology, is supposed to be doing the new and untried, and advance things. So the whole nation can benefit from all of these new things when NASA has demonstrated they can be done. But inherent in that mission is the fact that occasionally you're going to be getting out a little too far. If you're not getting out too far once in a while, you're probably not really working hard enough. So we can anticipate that there will be failures. You want to make darn sure that human life is not involved when they occur.

**EIR:** What has been the response to the Commission report, so far?

**Paine:** I'd say we're getting two types of responses. One, we're getting from some of the more superficial rip-and-read commentators, who just look at it and say, "Oh my God. It sounds like Buck Rogers. You're proposing to spend a lot of money." They haven't read it carefully. I think they haven't thought much about it. The real response we're getting from a lot of people is that it's beautiful timing, that the nation really needs to be taking a look at where we're going in space and why. And that our report provides a framework that can now provide a means of national debate and settle some of these points.

A lot of people feel that we haven't really had a presidential inspection and declaration of space policy for 25 years. It was John Kennedy who said that the United States cannot

afford to be second in space, and in order to get in the forefront, we are going to go to the Moon within eight years. Since that time, most presidential declarations have taken the form of, "what piece of hardware shall I buy next," as though you were going to get a space policy by going down to the used car lot, and picking out which car you were going to buy. We need a really thoughtful look, and I hope very much that our commission can be the catalyst that lets the nation debate it. And of course, that is why we published this, and distributed it widely throughout the country through bookstores via Bantam Books, and why we brought out the 30-minute TV tape so every high school student and any person at all who has any interest in space, can take a look at it on the TV, as well as on the Gutenberg written form.

**EIR:** After the lunar landing in 1969, when you were the NASA administrator, a similar report was done to look at long-term goals for the space program. How is your current report similar to that one, and how is it different?

**Paine:** I think the similarity is that any time you look at the particular Solar System in which we live, and the particular technology that we've attained in the second half of the 20th century, you're going to come up with rather similar conclusions, and I think you do that whether you are in Washington, or Moscow, or Tokyo, or Paris, or Beijing. So there are certainly some similarities. The nearest planet that could support life, that is still, as far as we know, lifeless, is Mars. The Moon is still the nearest celestial body to us, although it doesn't have some of the essential ingredients like water. You come up with somewhat similar goals as to where you should be.

But I think the difference between this and the 1969 effort, is that we are now 15 years farther along into the space program, we have the Space Shuttle, and although it has to be rebuilt, I think it will be an even better system at the end of that time. We've gotten a much bolder and farther-ranging look out of this long, one-year Space Commission study than we did in the 1969 study.

**EIR:** What do you think are the key technologies that have advanced which could lead to an accelerated time schedule?

**Paine:** The principal technologies that have advanced are the Shuttle technology, which is giving us much easier access to space, and allows us to go up there and fix things, to assemble things in orbit, which we couldn't have done with the old Apollo rocket. Secondly, the era of the supercomputer has come upon us now, and for the first time we can begin to design post-Shuttle systems using the great power of modern computer technology. Fifteen years of advances have effected the revolution there. We can design systems today that simply would have been out of the question back in the 1970 era.

**EIR:** One thing that is clear in your report, is that it is a very tight time schedule and ambitious program. Today, of course, the Shuttle is not flying. How important do you think it is to

get the Shuttle flying as soon as the fixes are made on the system?

**Paine:** I don't think the actual date that the Shuttle flies again is too critical. I think the important decision is, are we going to add a fourth Shuttle to the fleet so that we'll have adequate capacity to handle both the civilian and military payloads? And secondly, I think the question of the degree to which the Shuttle is going to be able to handle repetitive payloads on a reasonably rapid turnaround schedule, and therefore, again, the question of capacity—these will be the critical things. Whether it starts out this month or another month, or the month after that, is less important than the fact that the Shuttle has to be fixed, and it has to be fixed so it can fly both safely and reliably, and often.

**EIR:** At the end of the report, you included a chapter on the importance of the space program in education. How would you see your program being able to change the situation in education in the United States?

**Paine:** I don't think that we would propose that NASA take over the Department of Education. We've got a perfectly good Department of Education, and it has the same concerns that we have. But in the Space Commission's report, we did have the feeling that NASA can provide a tremendously powerful motivation to young people, to see that careers in science and technology can be exciting and challenging and fun, and a good way to spend your life, advancing humanity out on the space frontier. I think it's the whole motivation for getting a technical education, that the space program can help so much. Programs like the Young Astronauts, that get young people's imagination and make them willing to make the sacrifice of working hard, and doing the homework and taking the tough courses in high school, so they can participate in this very important advance.

**EIR:** What is the schedule for the report now? Will the President come out with a statement on the report?

**Paine:** The report goes both to the President and the Congress, who passed the legislation that created the Commission. The congressional committees have now received copies of the report and they will be holding hearings, probably in the middle of July, and the President's staff has now received the report, and the President himself will receive it shortly. I would guess that sometime around the middle of July he will probably want to issue some kind of statement on his reaction to the report, after he's had a chance to look at it.

**EIR:** There is certainly a fight in the White House, and a stalemate in Washington, as to what to do next.

**Paine:** I think we have to get the Rogers Commission report out of the way, and that's happening this weekend, and then, after that, I hope there will be a great deal of thought given to America's future in space and what kind of 21st-century space program we should have.