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## **Bioterrorism Panel**

Wednesday 10/10/2001

Dr. Matthew Meselson, Dr. Stephen Morse, and Nicholas Wade of The New York Times tackle the issue of bioterrorism and inhalation anthrax.

CHARLIE ROSE Joining me now from Boston, Dr. MATTHEW MESELSON, Professor of Biology at Harvard University. Here in New York, Dr. STEPHEN MORSE of the Mailman School of Public Health at Columbia University, and NICHOLAS WADE of the New York Times. I am pleased to have each of them. Nick, give me an update, if you will, in terms of where you think we are today.

[Nicholas Wade](#): Well, we have still have one person infected with anthrax; a form called inhalation anthrax. And we have a second person who carries the disease but has not yet come down with it. I guess you'd call him a carrier rather than someone who was infected. They both worked in the same building. Inhalation anthrax is a very rare disease; only 18 cases in the last century. To have just one case anywhere in Florida in an office building is extremely unusual. To have two is even more so.

[Charlie Rose](#): And so what do they-- what's the conventional wisdom or the informed wisdom about how it happened?

[Nicholas Wade](#): Well, I think one shouldn't jump to conclusions. It's still possible that a natural explanation will be found. Medicine is full of exceptions. But as of right now it does look unlikely. All these past cases of inhalation anthrax we've had have taken place in special environments where for some reason lots of the spores of this bacterium have been airborne. So you find them in tanning factories, in wool factories, in bone meal factories and in laboratories where people have been studying the organism and are being careful. This office environment is none of those things.

[Charlie Rose](#): Dr. Meselson, what do you make of this case so far? Dr.

[Matthew Meselson](#): I'm not totally convinced on the basis of what I've been able to read that it is inhalation anthrax, although it certainly looks that way. The claim is there are no skin lesions, but probably it's only at autopsy, if then, that we can be absolutely sure of the portal of entry. Though it does look inhalation.

[Charlie Rose](#): OK, and what's the significance of inhalation? Dr.

[Matthew Meselson](#): That somebody would have been able to make an aerosol which is something of a technical accomplishment.

[Charlie Rose](#): A significant technical accomplishment to make an aerosol? Dr.

[Matthew Meselson](#): For an ordinary person, yes. Only very few people would know how to do that.

[Charlie Rose](#): How much of this have you seen? Dr.

[Matthew Meselson](#): What do you mean?

[Charlie Rose](#): Inhalation. Anthrax inhalation. Dr.

[Matthew Meselson](#): Oh, I've never seen a patient. I've seen a lot of slides of tissues. We went to Sverdlovsk in Russia, Yekaterinburg twice. And we investigated the outbreak there and proved that it initiated from a military source. But I have never seen a patient. I've seen autopsy specimens. I've seen the bacillus of the spores. And we have interviewed many of the families of those who died there.

[Charlie Rose](#): And what did you find out from those interviews? Dr.

[Matthew Meselson](#): This is described in an excellent book by Jean Gilman, who is also my wife, called Anthrax: Investigation of a Deadly Outbreak. And what we saw was that you had people falling ill with symptoms that seemed to be initially rather flu-like and then rapidly getting ill with onset spread out over an enormously long period of time, up to six weeks, although most of them were over with in 10 days or so. Nevertheless, some didn't appear until many days after the release of anthrax. The release was from a Soviet military establishment. It went downwind and killed sheep and cows up to a distance of 50 kilometers. They clearly knew how to make an aerosol.

[Charlie Rose](#): Stephen, what do you make of this? Dr.

[Stephen Morse](#): I would agree with Matt. I think that this unfortunately seems most likely to be intentional. But I wouldn't make-- I also would not make the leap to bioterrorism or to larger organizations. It could very well be someone who managed to acquire this somehow, who has some personal reason for doing this. We don't know what that is. Hopefully some of the investigation, I think, will unfold and we'll learn more about it. I think this is very rare as a natural occurrence, although there are a few cases known.

[Charlie Rose](#): What would you say about anthrax as a potential weapon of choice by bioterrorists?

[Stephen Morse](#): As Dr. Meselson says, for those who are able to make it -- and that is a significant technical accomplishment -- you know, it has certain properties that unfortunately make it attractive to the bioterrorist.

[Charlie Rose](#): And they are?

[Stephen Morse](#): One of which is that you can handle it relatively safely if you take the appropriate precautions. It's relatively easy to grow and prepare if you know how to do it. It is technically difficult, but you know the bug grows pretty well and it can be done. And it has the advantage that it can be delivered if one has the technical ability to do this in a fairly predictable fashion. This is why it was of interest to, among others, the Iraqi BW program and other bio-warfare programs in the past.

[Charlie Rose](#): How far along was their program?

[Stephen Morse](#): They were able, as far as we can tell, they were able to make anthrax that could be delivered by a variety of means, similar to what Dr. Meselson mentioned with respect to the Sverdlovsk in '79.

[Charlie Rose](#): What would be the most efficient means of delivering it, Nicholas, do you think?

[Nicholas Wade](#): Well, it's very hard to deliver it. It's very hard to disperse it properly. I presume if you release a cloud of sort of finely aerosolized particles in the wind, then you will infect people downstream. It's quite hard to--

[Charlie Rose](#): As with the cows and dogs downstream from--

[Nicholas Wade](#): It's a rather random process, which is why it's not a good military weapon. I mean, cities are sort of heat islands so your stream of particles would just skip the city. If they come against a building, the spores would just fall to the earth and be harmless. Dr.

[Matthew Meselson](#): This has a long history. In World War II, the British ordered half a million anthrax bombs, four-pound anthrax bombs, from the United States. And we built a large factory in Indiana, 10-20,000 gallon fermenters. But the war ended before they could be produced. This kind of work continued in this country. Anthrax was considered a lethal weapon in our arsenal. It was ultimately replaced by tularemia because it is difficult to know just what is the dose of anthrax that would have a fatal effect on a population. Apparently the Soviets didn't give up anthrax because they constructed, at least at one site, a very large facility for producing it in the 1970's. So it goes way back, at least to World War II. And the first use of it in a serious military way seems to have been by the Japanese Imperial Army in the war in Manchuria during World War II. Otherwise it has never been used in war.

[Charlie Rose](#): Have you been called in as an expert to be advising the United States government in any way about the potential threat? I don't mean by this testifying before Congress, but by the executive branch to say, you know, what do we have to fear here and what should we do and how should we go about homeland security? Dr.

[Matthew Meselson](#): I've been doing this for nearly 40 years, so yes. The answer is yes.

[Charlie Rose](#): And so what are you advising them today? Dr.

[Matthew Meselson](#): Today, as always, there are three levels of activity that need to be paid attention to. The first, which would be the most effective if you could do it, is to prevent it ever from happening in the first place. It's very much like the ordinary practice of public health. The next would be if it does happen, to protect people from becoming infected; that is to keep the agent from reaching them in the first place. That would require some generic approach such as filtering the air. And the third would be if people do become infected, to try to save as many as you can. America is a huge country, many people, many places. There's no way that any one of these levels is going to succeed in averting the use of biological weapons. But all three together are certainly better than concentrating on only one or two.

[Charlie Rose](#): What is the most likely weapon of choice? Dr.

[Matthew Meselson](#): It's impossible to say that. There's a NATO threat list with about 30 agents on it. There is an international draft treaty list with a similar number on it. There's a list of those agents which governments have admitted that they developed, both us and the British and the Russians - - Soviet Russians -- as weapons. So all told, there are at least 50 different agents that have attracted serious military developmental interests.

[Charlie Rose](#): Steve?

[Stephen Morse](#): I think there is one thing from which we can take some consolation, and that is we have a public-health system. And that public-health system needs to be strengthened. But it can provide the generic capabilities to look for unexpected outbreaks or infectious disease because we really do need to expect the unexpected. I think that, Matt, your comments are exactly right on target. And I think that's extremely important. One of those components is public health, which can look for outbreaks of infections, unexpected occurrences of infectious disease and respond appropriately. We've seen that happening here in the events that unfolded in Florida -- public health identifying this case and acting appropriately to see if there were other cases, identify the source of exposure and follow up appropriately. But this is something we need to sustain for the future so that we can have a system that will protect us against both the known threats and those that people might think of in the future.

[Charlie Rose](#): Let me read from a New York Times op-ed. "The discovery that second Florida man was exposed to anthrax and that anthrax spores have been found in the building where he and another victim worked has raised anew the question of whether biological terrorists might have been at work. The great unanswered question is whether the contamination was the work of terrorists or a crime of some sort or has a more benign natural explanation." I understand from both of you-- believe that it was a crime of another sort and not the work of terrorists. Correct?

[Stephen Morse](#): That seems the easier explanation to accept. Yes.

[Charlie Rose](#): Yeah.

[Stephen Morse](#): I think--

[Matthew Meselson](#): I would pick up on something that Steve Morse said. He said it was very unexpected. And, of course, that's exactly right. But that should draw our minds to the fact that there are lots of other kinds of evil deeds that are very much expected -- bombs, for example.

[Charlie Rose](#): Right.

[Matthew Meselson](#): So, what does that tell us? It tells us that at least up 'til now there has been a norm of behavior, of international behavior. This is something that is not done. Human beings have avoided the use of disease as a weapon. And now the bigger issue that this draws us to is here we are entering a new age of biotechnology. Every previous technology in the history of our species has been used not only for peaceful purposes, but for hostile ones. If that's repeated with biotechnology, the technology that will enable us in time even to change what it means to be human--

[Charlie Rose](#): Yeah.

[Matthew Meselson](#): --to manipulate cognition, development, reproduction, everything. This is a choice for the human species. This is a point in our history that will require the greatest wisdom, not just to respond to the present threat, but to develop a system in which this is considered a crime against humanity. Today we do not have criminal law that would make making biological weapons or using them or threatening to use them a crime against humanity. We should do that to create legal jeopardy to those who do it. And we should do much more at the level of prevention.

[Charlie Rose](#): And anyone who uses it immediately becomes a war criminal in the legal sense of that.

[Matthew Meselson](#): Yes. The same way that Augusto Pinochet ran into trouble in Great Britain or that Milosevic is in trouble in the Hague. The kinds of treaties, of which there are very few, apply to airline hijacking, to torture, to hostage-taking, to a very few other crimes -- harming of diplomats.

[Charlie Rose](#): Here--

[Matthew Meselson](#): There should be a new one that applies to biological weapons.

[Charlie Rose](#): OK. I want to open this up for everybody because Nick Wade and I -- as you may or may not know -- have spent hours at this table talking about the potential of the mapping of the human genome and the mapping-- and gene therapy and all kinds of molecular biology potentials. Have we not?

[Nicholas Wade](#): Yeah.

[Charlie Rose](#): All right. So, having said that, here comes Dr. Meselson to say, "Wait a minute, we need to think about the downside of this as well and make sure that the human community understands that and that they list it, you know, as a most heinous crime."

[Nicholas Wade](#): Well, Matt Meselson has been in the forefront of those who wish to keep biology and our new knowledge of the genome reserved for medical-- for medicinal uses and not turned to malign uses. And I hope that will be the case.

[Charlie Rose](#): Everybody-- Most people would agree with that, wouldn't they?

[Nicholas Wade](#): They would. The question is whether this is a weapon of choice for terrorists.

[Stephen Morse](#): Not just terrorists.

[Nicholas Wade](#): I think our terrorist--

[Stephen Morse](#): But those who are weak.

[Nicholas Wade](#): --experts.

[Charlie Rose](#): I'll come right back to you.

[Nicholas Wade](#): In a way, our terrorism experts, I think, have misled us in their speculation of exotic means like nuclear weapons and biological weapons which have never, up to now, been used -- unless the Florida case is an exception -- because I don't think -- I'm not an expert on the terrorist mind-set, but I think they choose targets first. And, once they choose targets, they then choose the simplest available means to attack the target--

[Charlie Rose](#): No, yeah. Yeah.

[Nicholas Wade](#): --up to now has been bombs (crosstalk)

[Charlie Rose](#): They tried to blow up the World Trade Center--

[Nicholas Wade](#): They (crosstalk)--

[Charlie Rose](#): --Trade Center one way, then they tried it another way.

[Matthew Meselson](#): Yeah. I don't think terrorists can change the course of history except by causing great states to do things. So, I think that the key problem here--

[Charlie Rose](#): Well, that's exactly what-- That's exactly what we believe Osama bin Laden is trying to do.

[Matthew Meselson](#): Exactly. But I believe here in this particular problem -- that it's the states that we need to worry about, also for the technical reason that only a state can develop biological weapons to their real potential. It's states we need to deter. But, on the other hand, a state is made up of individuals. And we need to bring home to those individuals, including heads of state, that if they do this they run the risk of finding themselves in jail.

[Charlie Rose](#): You accepted opinions expressed here that this probably was foul play and not--

[Matthew Meselson](#): That's something that looks most likely. But, if you decide that is the case I think the next question is what kind of weapon was it. Was it something that a lone terrorist could grow up in his kitchen? Or was it the sophisticated of a military-biological research program? And I think we're going to know that fairly soon from study of the particular strain. You can-- you can pinpoint the geographical location of any anthrax strain.

[Charlie Rose](#): Yeah.

[Matthew Meselson](#): So, if it's domestic one-- if it's homegrown, that will be one thing. If it's foreign, that will be another.

[Charlie Rose](#): Yeah. Do you have an opinion on this?

[Stephen Morse](#): Yeah. No, I agree. I think--

[Charlie Rose](#): Wait for the results.

[Stephen Morse](#): And it will be very interesting -- unfortunately -- to find out, you know, what we learn about its source. I think there's one other point also. You know, you mentioned earlier biotechnology and the possibility that biotechnology, of course, could be a double-edged sword. Similarly the feelings that people have about disease and about biological warfare -- that aversion that Matt Meselson mentioned a few minutes ago -- is also one of the powerful tools allied with the terrorist and with the person who uses this for nefarious purposes because the mystery, the sort of sense of vulnerability this arouses in us, the feeling that-- We have images of the great plagues of the past. And it really taps into it-- even one case of anthrax taps into all of these very emotional feelings we have. And I think it's very important to put this in its perspective as an infectious-disease problem and also to understand, you know, we're not seeing The Andromeda Strain and we really need to inform and inform ourselves about this so that we can remove some of the mystery that surrounds both-- The aversion is a good thing, but at the same time, you know, the other side of that is the problems, the fear, just sheer terror that this can arouse. We should not allow ourselves to feel that. This can be put in perspective.

[Matthew Meselson](#): Yes. I agree with that. I think if we do the right things, we can conquer this problem. But we must do the right things.

[Charlie Rose](#): OK. That's such a pregnant conclusion. The right things are? Just help me close-- Tell me what the right things are.

[Matthew Meselson](#): There are three levels. One is to prevent it. We do that, for example, by re-instituting the attempt to create an international treaty that would involve declarations and inspections. Number two -- we create international criminal law--

[Charlie Rose](#): Right.

[Matthew Meselson](#): --that would make enemies of humanity of anybody who does this. At the level of protection, there's a lot of technical things to do. We should filter the air in our large buildings and apartment houses just because of air pollution. That's a good reason enough. That would also offer some protection to those who dwell in that filtered air. And thirdly, although this is not a generic approach, for some of these disease-- After all, we haven't cured cancer. We haven't cured AIDS, and we still have the common cold. So, it's not any day soon that we're going to have medical defenses this panoply of possible agents. But there are defenses against some of them. And those should be studied and made available.

[Charlie Rose](#): Let's get on with it.

[Stephen Morse](#): Right.

[Matthew Meselson](#): Yeah.

[Charlie Rose](#): Thank you very much, MATTHEW MESELSON, professor of biology at Harvard. Here in New York, Stephen Morse, Mailman School of Public Health at Columbia; and my friend, NICHOLAS WADE from the New York Times. Thank you.