BIOWATCH: EVEN STUPIDER THAN REAGAN'S "STAR WARS" SYSTEM

On July 31 of this year, President Barack Obama signed a cover letter attached to the White House release of the National Strategy for Biosurveillance (pdf). The misguided premise on which this strategy (and the underlying boondoggle of the program known as BioWatch) rests stands out clearly in the President's opening sentence:

> There is no higher priority than the security and safety of the American people.

The mass delusion that total safety is both achievable and worth the tremendous sacrifices of resources and liberties that would be needed to even get close to such a state got a huge boost in President Ronald Reagan's watershed "Star Wars" speech of March 23, 1983, giving birth to the Strategic Defense Initiative. It was clear from the start that this program had no chance of working as Reagan dreamed it, but massive amounts of money went into the program anyway, as William Broad described last month (emphasis added):

> Since the 1980s, when President Ronald Reagan began the modern hunt for defenses against long-range missiles, Washington has spent more than **$200 billion** devising ways to hit incoming enemy warheads that move at speeds in excess of four miles per second. Critics have long faulted the goal as delusional, saying that **any country smart enough to make intercontinental ballistic missiles could also make simple countermeasures sure to foil any**

> **defense**.

President George W. Bush announced the program that would become BioWatch as a part of his larger Project Bioshield in his 2003 State of the Union address (again, emphasis added):

> We've intensified security at the borders and ports of entry, posted more than 50,000 newly trained federal screeners in airports, begun inoculating troops and first responders against smallpox, and are deploying the **nation's first early warning network of sensors to detect biological attack**.
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> /snip/
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> I thank the Congress for supporting these measures. I ask you tonight to add to our future security with a major research and production effort to guard our people against bio-terrorism, called Project Bioshield.
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> The budget I send you will propose almost $6 billion to quickly make available effective vaccines and treatments against agents like anthrax, botulinum toxin, ebola and plague. We must assume that our enemies would use these diseases as weapons, and we must act before the dangers are upon us.
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> (APPLAUSE)

The monitoring system that is now BioWatch is rife with problems. David Willman of the Los Angeles Times has continuously documented the many problems with and failings of BioWatch. He has informed us of the extremely high false positive rate from the currently deployed version of the system and has followed in real time the failures as DHS has forged ahead in purchasing the next generation of the technology before it is ready.

Willman's latest article, carried by McClatchy,

reveals jaw-dropping failures by the BioWatch system along with a cynical cover-up by the Department of Homeland Security:

> For two years, the nationwide BioWatch system, intended to protect Americans against a biological attack, operated with defective components that left it unable to detect lethal germs, according to scientists with direct knowledge of the matter.
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> The federal official who oversaw installation of the components was quietly shifted to a position with no responsibility for BioWatch, and the entire episode was kept out of public view.

Willman continues:

> The Los Angeles Times reported in July that BioWatch has been unable to distinguish between dangerous and benign organisms, and that as of 2008, federal agencies had documented 56 false alarms.
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> /snip/
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> Not once have public health officials had enough confidence in a BioWatch alarm to evacuate an area, dispense antibiotics or take any other emergency action.
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> After considering the potential disruption from false alarms, federal aviation officials shelved plans to install air-sampling units inside the nation’s major airports.

To go a bit further into the science of BioWatch, consider this patent application from Lawrence Livermore National Laboratory. Here is a description of the underlying science of a candidate next generation device developed at Livermore:

> Particles are drawn into the system that is designed to only allow the collection of particles of a pre-set size. The pre-set size can be selected as desired. The system is designed to only collect particles that are desired. The accepted particles continue on into a separator section that returns all the particles that are not of the desired size back into the environment. The remaining particles, are known as the product, flow. The product flow continues into the detection sections.
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> /snip/
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> The present invention provides an Autonomous Pathogen Detection System (APDS) for monitoring the environment to protect the public from the release of hazardous biological agents. The Autonomous Pathogen Detection System is a countermeasure to bioterrorism, one of the most serious threats to the safety of United States citizens, citizens of other countries, and the military.
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> The APDS program was initiated to fill the requirement of a distributed environmental monitoring system for civilian applications. Multiplexed assays are used to reduce reagent costs, making long term monitoring operations possible (e.g., U.S. Postal Service mail screening). A unique, orthogonal detection approach that combines antibody-based and nucleic acid-based assays reduces false positives to a very low level. Antibody assays allow the detector to respond to all types of bioagents, including those without nucleic acids such as protein toxins. Nucleic acid assays allow much more sensitive detection, reducing the number of sensors needed to protect a given area. The fully autonomous aerosol collection and sample preparation

> capabilities limit maintenance requirements and makes integration into a central security or monitoring network possible.

The detection system is designed to sample particles from the air and select only particles that are of an appropriate size to be biological weapon agents. The system then looks for specific chemical structures on the outsides of the particles using antibodies and specific DNA sequences inside the particles using the highly sensitive process of polymerase chain reaction, or PCR.

This system is only as good as the set of antibodies used for looking at the outside of the particles and the set of DNA primers used to look for specific DNA sequences inside the particles. Even if this system can be made to function perfectly within its design parameters, the very same critique bolded above about the Strategic Defense Initiative comes into play. Most terrorists capable of producing a biological agent would also be capable of altering the agent to render it invisible to the BioWatch system.

Even this patent application itself plays into the security theater which enabled such large amounts of money to be wasted in this pointless exercise (empahsis added):

> **Terrorists sending anthrax-contaminated packages**. Militant organizations obtaining potassium cyanide. Religious cult members poisoning local residents to fix an election. Sadly, these scenarios are not the plots of the three latest bestsellers, but rather, very real incidents with a very real danger. By the mid-1990s, the U.S. Congress began to assess the vulnerability of the U.S. civilian population to biological terrorism and found us considerably lacking in our ability to cope with even a small-scale biological event. Initial

> thinking was that Department of Defense technology could be readily transferred to the civilian arena. However, upon further reflection, it was concluded that although there was overlap between military and civilian defense needs, in the case of a biological threat, there are marked differences: (1) the soldier is trained and equipped with protective gear so he may respond to a threat quickly enough to prevent a lethal dose; (2) military intelligence usually reduces the potential threat to a relatively small number of biological agents; and, (3) military battlefield tactics are designed to minimize the density of soldiers. The civilian population, however, is neither trained nor equipped, is vulnerable to any conceivable pathogen and often gathers in large crowds (special events, sporting venues, etc.) where a small release could potentially infect thousands. In response to these differences, federal agencies, including Department of Energy, have recently begun funding directed research efforts to reduce civilian biological terrorist vulnerabilities.
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> At present there are more than 30 pathogens and toxins on various agency threat lists. Public health personnel rarely see most, of the pathogens so they have difficulty identifying them quickly. In addition, many pathogenic infections aren’t immediately symptomatic, with delays as long as several days, limiting options to control the disease and treat the patients. The lack of a practical monitoring network capable of rapidly detecting and identifying multiple pathogens or toxins on current threat lists translates into a major deficiency in the United States ability to counter biological terrorism.

Despite playing up the fears of biological attacks on the population, this passage in the patent application demonstrates the failings of the idea of developing a comprehensive monitoring system. Only those participating in the delusional DHS gravy-train associated with BioWatch would believe that by monitoring only 30 agents we are providing any kind of realistic safety to the population. And look how this fear-mongering passage starts by referencing the anthrax attacks of 2001. The only site at which monitoring of air would have given any sort of warning on those attacks would have been the letter sorting facilities where some anthrax spores were released as the letters went through the system. Even then, the monitors would have needed to be at just the right position near the proper part of the system that squeezed the spores out of the pores of the paper envelopes. A next generation anthrax attacker will be fully aware of what happened in 2001 and can take very simple steps to assure that spores from any package would not be released until the intended recipient opens the package.

Willman also points us to a recent GAO report (pdf) outlining deep flaws within the DHS process of funding the next generation of BioWatch:

> DHS approved the Generation-3 (Gen-3) acquisition in October 2009, but it did not fully engage its acquisition framework to ensure that the acquisition was grounded in a justified mission need and that it pursued an optimal solution. The performance, schedule, and cost expectations presented in required documents when DHS approved the acquisition were not developed in accordance with DHS guidance and good acquisition practices—like accounting for risk in schedule and cost estimates. Since October 2009, the estimated date for full deployment has been delayed from fiscal year 2016 to fiscal year 2022. The 2009 life-cycle cost

> estimate—a point estimate unadjusted for risk—was $2.1 billion. In June 2011, DHS provided a risk-adjusted estimate at the 80 percent confidence level of $5.8 billion. Several steps remain before DHS can fully deploy Gen-3 including additional performance testing, operational testing, and developing location specific deployment plans.

In short, the desire to detect biological weapons when released in aerosol form is admirable, but even short reflection on the idea would suggest that monitoring all of the air all citizens breathe for all possible biological agents that could be used as weapons simply is not feasible. Relying instead on the existing public health system and increasing real time data monitoring to detect outbreaks of unexpected symptoms and combinations of symptoms remains the primary tool that should be relied on in monitoring both for the emergence of bioweapon attacks and for the emergence of new versions of existing pathogens. Note that because it only detects known pathogens, BioWatch is essentially useless for the important function of monitoring for the emergence of new pathogens such as SARS.