Bio Terror Bible

EXPOSING THE COMING BIO-TERROR PANDEMIC

BIOTERRORBIBLE.COM: The following propaganda was published within the calendar year of 2002. While some of the following reports may have been legitimate news stories, most if not all of them appear to be blatant propaganda with the overall goal of convincing American and the World that it is on the precipice of a bio-terror induced pandemic. The fact that this propaganda exists in mass confirms that an upcoming bio-terror attack is in the cards and may be played in a last ditch effort to regain political, economic and militarial control of society.

Title: Public Health Coordinator Donald Henderson Waging War On Bioterror
Date: January 1, 2002
Source: Discovery

Abstract: Donald Henderson was worrying about biological warfare long before anthrax started working its way through the postal system. As science adviser to George Bush and a senior health official in the Clinton administration, he heard firsthand about our country's vulnerabilities. In 1995, he continued his study of bioterror at Johns Hopkins University, where he headed the Center for Civilian Biodefense Studies. Now Henderson is director of the new federal Office of Public Health Preparedness, which will coordinate the national response to health emergencies. Sitting in his office at Hopkins, he shared his insights with *Discover* writer Rabiya S. Tuma.

What convinced you to focus on bioterrorism so early on?
Up until 1995, bioterrorism was considered improbable. Then three events happened. First, the Aum Shinrikyo released sarin gas in the Tokyo subway. It was discovered that they had been working with anthrax and botulinum toxin and had tried to aerosolize anthrax throughout downtown Tokyo. Around the same time, Saddam Hussein's son-in-law defected and brought with him papers showing that Iraq's germ warfare program was shockingly extensive. But the really serious event was the discovery of the magnitude of the biological weapons program in the Soviet Union. It was beyond anything we imagined, involving 60,000 people working in 50 different laboratories. It rivaled the size of their nuclear program.

Have we improved our readiness for a bioattack since then?
As late as 1998, the Centers for Disease Control and Prevention had nobody assigned to work in this area. Similarly at the National Institutes of Health there was no program, nobody assigned to it, and no money appropriated. Now the CDC does have a program for biological preparedness, and the NIH has a special research program. So we've improved, but we still have a long way to go.

Where are our weakest points?
We have a very weak point in our public health infrastructure. We depend on it being there 24 hours a day, seven days a week—just like the fire department—so if somebody calls up with something really strange, the public health authorities should be ready to move in and confirm, diagnose, detect other cases, and set up control measures. But we've allowed that infrastructure to deteriorate over the decades. And there are a lot of things we could do to speed up the research process so that when we see a biological agent, we are able to develop antibiotic or antiviral preparations or vaccines very rapidly. Such preparations would also be beneficial for dealing with natural infectious diseases, particularly emerging infections.

What makes a particularly effective bioweapon?

Clearly almost any agent that produces an infection could, in theory, be used as a weapon. But with ordinary influenza, for example, we have epidemics every two or three years; while a lot of people get sick and a number of them die, cities continue to function. We looked at agents that would be more disruptive than others, either as a result of the deaths that they caused or because of their ability to spread panic. We came up with six prime candidates: smallpox, anthrax, plague, botulinum toxin, tularemia (rabbit fever), and hemorrhagic fevers (a group of viral bleeding diseases that includes Ebola).

You fought to eradicate smallpox, yet people now list it as a potential weapon. How did this happen?
I am deeply, profoundly angry with the Soviets. The Soviet Union, in 1959, proposed to the World Health Assembly that the World Health Organization undertake the eradication of smallpox. During the program the Russian government provided 25 million doses of very high quality vaccine every year. They were extremely proud that they had played an important role in the eradication program. We finally declared the eradication of smallpox in 1980 at the assembly. We persuaded governments and laboratories to get rid of their stocks, and they did—to transfer them to one of two places, one in the United States and one in Russia. Then from 1994 to 1995, it became apparent what the Russians had been up to: They had been weaponizing smallpox. The people I worked with did not know about this; it was the military that was driving the weaponizing program.

How hard would it be for a terrorist to cause a widespread infection in a mall or a baseball stadium?
A number of our colleagues have expressed again and again how difficult it would be to identify a lethal agent, get a hold of it, grow it up, put it in the proper form, and disperse it. But I'd wager you could cause a lot of trouble and tens of thousands of casualties would not be out of the question. And who is to say a terror group couldn't purchase biological weapons material already prepared and ready for use? After all, those who flew the airplanes into the World Trade Center didn't need to know how to build airplanes (Discovery, 2002).

Title: 'Be Ready' For Attack
Date: January 4, 2002
Source: UCLA

Abstract: THE top biological terror expert in the US has warned Australians may have to better prepare for such an attack. Director of the US National Institute of Infectious Allergy and Diseases, Dr Anthony Fauci, said a terrorist on a suicide mission could just as likely be armed with smallpox as a bomb and the impact on Australia from such an attack might only be as far away as an overseas tour group.

Dr Fauci was commenting on plans by the US Government to provide a smallpox vaccination for any citizen who wants one. Australia will soon have to make a difficult decision on how to deal with the threat of smallpox, and may have to take similar action, Mr Fauci said.

The risks for smallpox vaccination are one-to-two deaths per million people vaccinated. "Australia has to make their own decision," Dr Fauci, among US President George W Bush's smallpox policy advisers, said.

"They have to make that decision based on their assessment of what the threat to them is. "Either from a direct attack on Australia or from an attack for example in the Middle East and then people travel back and forth to Australia."

Dr Fauci said his advice was that ordinary people should not get vaccinated against smallpox. But he said a group of healthcare workers, smallpox response teams and first responders like firefighters and policemen should be vaccinated. "If nobody's vaccinated and then there's a massive attack the people who are going to go in and try and put the fire out are going to be susceptible themselves," he said.

Professor of preventive medicine at the University of Southern California Dr Thomas Mack, a veteran of the 1960s smallpox wars in South Asia, has argued that today's media-drenched society would give a community ample warning of an outbreak and good opportunity to contain its secondary spread. "I would be against getting a vaccination policy of healthy Australians," he said.

Meanwhile, the growing terrorism threat has led Britain's biggest home insurer to specifically exclude cover for chemical, biological and nuclear attacks, a London newspaper reported.

"After September 11 we felt it was necessary for our customers to understand what they are covered for," Norwich Union spokesman David Ross told The Independent newspaper. "People are worried about the chemical, biological and nuclear threats and wanted to know where they stood with our policies."

In an unprecedented move, renewal documents sent to householders by Norwich Union since January 1 warned that their home and contents policies would not entitle them to compensation for damage caused by such attacks, the paper said (UCLA, 2003).

Title: Senator Cautions On Bioterrorism
Date: April 26, 2002
Source: UCLA

Abstract: Biological terrorism remains a serious threat to America, Sen. Bill Frist, R-Tenn., warned Thursday.

"The risk is real. The risk is increasing. Our vulnerability remains high," Frist said at a briefing in an office building closed for months following last fall's anthrax-by-mail attack.

Sidney Taurel, chairman of the drug maker Eli Lilly and Co., called for cooperation among government, academic researchers and the pharmaceutical industry in finding new ways to detect and combat bioterrorism.

"This is not business as usual. This is not politics as usual. This is war," Taurel said at the briefing on terrorism and community preparedness held in the Hart Senate Office Building.

Frist, a transplant surgeon, said last fall's anthrax attack "was very successful ... and as far as we know this person's still out there."

More than 20 people became ill and five died following the mailing of anthrax-tainted letters from New Jersey. Some postal facilities remain closed because of the contamination. No arrests have been made despite a $2.5 million reward being offered by the Postal Service and FBI.

Frist told the session that between 11 and 17 countries either have stockpiled biological weapons or have bioweapons programs, including such threats as anthrax, botulinum toxin, tularemia, smallpox, plague and ebola.

Yet nine out of 10 public health departments in the United States don't have anyone trained in combating bioterrorism and as many as one-third lack an Internet connection for fast communications, Frist said.

In addition, he noted, only a small proportion of imported food is inspected.

Taurel said that in recent years there has been an increase in drug-resistant germs. In addition, he said there has been the emergence of newly discovered diseases such as ebola about which little is known, and there is a growing threat of manmade pathogens.

"Far from gaining control over infectious diseases, we are losing ground," he said.

The nation has been through a waking nightmare with the anthrax attack, Taurel said, and he fears that as the tragedy fades from the headlines the country will drift back to sleep (UCLA, 2002).

Title: Montana Lab May Lead Bioterror Defense
Date: April 28, 2002
Source: UCLA

Abstract: A laboratory in Montana's Bitterroot Mountains is on track to become the federal government's fourth Biosafety Level 4 research facility, handling the world's most dangerous microbes to help develop defenses against bioterrorism.

Rocky Mountain Laboratories, a part of the National Institutes of Health, pioneered research into Rocky Mountain spotted fever and Lyme disease. It now has been approved for a $66 million expansion for bioterrorism research, including upgrades to the maximum security level. It will be the only Level 4 lab in the West.

James Musser, a biomedical researcher and a chief of one of the Rocky Mountain labs, said specifics of the expanded research in Hamilton have not been decided.

"Because of the limited space in a Biosafety Level 4 facility, one has to carefully choose exactly what kind of pathogens we're going to study," he said.

BioLevel 4 labs are the highest level security labs which, among other things, require workers to wear "spacesuit" style contamination jumpers. The government currently has Level 4 labs at Fort Dietrich, Md., Bethesda, Md., and Atlanta. The nonprofit Southwest Foundation for Biomedical Research operates one in San Antonio. Another Level 4 lab is planned at the University of Texas Medical Branch in Galveston.

The new lab was planned before Sept. 11 and the string of anthrax attacks that followed, administrator Pat Stewart said. Rocky Mountain already was studying organisms that could be used in biological attacks, and Stewart said existing expertise at the Rocky Mountain complex is the main reason for building the new lab there.

Rocky Mountain Laboratories, in a neighborhood of well-kept homes at the foot of the Bitterroot Mountains, began early in the 20th century. It now employs about 230 people and provides some of the best pay in Hamilton, a onetime timber town that is rapidly growing as a wilderness gateway and mountain retreat.

Officials have just begun conferring with architects and others involved in developing the new lab. For the community, information about the expansion came during a town meeting lab officials held in February.

"You have to view it as a positive thing," said pharmacist Wayne Hedman at Bitterroot Drug. "That is clean industry and a lot of the jobs are high-paying jobs."

The new lab may add 50 to 65 positions, Stewart said.

Hedman said that besides the economic impact of lab employees, he likes the intellectual enhancement that world-class scientists and their associates bring to this community of 3,700 people.

The hazardous nature of the new research does not concern him.

"There's enough redundancy, enough backup, in that whole process that I feel very secure," Hedman said.

But bookseller Cyndy Gardner said that while she appreciates the Rocky Mountain employees' impact on community life, she questions why the new lab must be built in the "warm, friendly, family-oriented neighborhood" where she is restoring a century-old home.

"They need to build it away from town," said Gardner, worried the lab could become a target for terrorists.

Stewart said there will be strengthened external security for all of the Rocky Mountain labs, with additional security features for the new building. Measures for dealing with hazards inside it will include airlock buffer zones, chemical decontamination and microfiltration of air.

Rocky Mountain Laboratories began during a much simpler time.

In 1910, a Bitterroot Valley camp served as the lab for researchers who found that ticks transmitted the disease now known as Rocky Mountain spotted fever. In the 1920s, ticks were ground up at an abandoned school near Hamilton to make vaccine against the disease.

Some 20 years later, workers in the buildings that are part of today's lab complex, which is on the National Register of Historic Places, made vaccines that protected troops against typhus and yellow fever during World War II.

The agent that causes Lyme disease, another disorder transmitted by ticks, was identified at Rocky Mountain Laboratories in 1982.

Following the anthrax attacks last fall, the Bush Administration agreed to spend $100 million to renovate the 35-year-old Fort Collins, Colo., lab belonging to the Centers for Disease Control and Prevention by 2006.

The enhanced Level 3 lab, which also operates near residential neighborhoods, conducts research on vector-born infectious diseases, such as Bubonic plague, dengue fever, yellow fever, West Nile virus, encephalitis, tularemia and Lyme Disease, many of which could be used as biological weapons. They all are diseases spread by arthropods, or mosquitoes, ticks, fleas, lice and flies (UCLA, 2002).

Title: Study Urges Focus On Terrorism With High Fatalities, Cost
Date: April 29, 2002
Source: UCLA

Abstract: A million people could die if terrorists launch a biological attack that widely disperses smallpox, anthrax, ebola or other agents, according to a new study that analyzes the damage that could be caused by the use of weapons of mass destruction.

Even though such a biological attack was deemed extremely unlikely, a team of scholars from the Brookings Institution said the Bush administration should concentrate homeland security efforts on similar doomsday terrorist scenarios that have the potential for causing the largest numbers of deaths and economic losses, and the greatest psychological damage.

The study estimated that 100,000 people would die if a nuclear bomb hit a major U.S. city and that 10,000 would perish in a successful attack on a nuclear or toxic chemical plant. If weapons of mass destruction were directed against the shipping industry, the report said, the economy could suffer up to $1 trillion in losses.

The report, scheduled for release Tuesday, is one of the most comprehensive studies since the Sept. 11 attacks, which killed more than 3,000 people at the Pentagon and World Trade Center and in Pennsylvania. The authors, who specialize in economic and foreign policy studies, said they hoped to aid policymakers such as Homeland Security Director Tom Ridge, who is developing a national strategy, figure out where to put resources.

Ridge's staff already has devoted much attention to "high consequence" scenarios, such as attacks using thermonuclear devices, smallpox and other potential weapons of mass destruction. But administration officials have cautioned that assessing threats and assigning probabilities is difficult because authorities don't know about all terrorist cells and because terrorists frequently shift tactics.

Because the government and private industry cannot guard against every conceivable kind of attack, the Brookings authors maintained that officials should devote the bulk of resources to protecting against nuclear, chemical or biological terrorism as well as more conventional large-scale attacks at places such as airports, seaports, nuclear and chemical plants, stadiums, large commercial buildings, and monuments and other icons.

"There are an unlimited number of potential vulnerabilities," said report author Michael E. O'Hanlon. "We're going to have to spend some time prioritizing and organizing our thinking. We really should be focusing on potentially catastrophic attacks, meaning large numbers of casualties or large damage to the economy."

O'Hanlon, who specializes in foreign policy studies, said the estimates concerning economic and human losses were based on a 1993 government report done for Congress about weapons of mass destruction, the casualties from the atomic bombs released in World War II, previous disasters and criminal acts, economic data and other factors.

The Department of Health and Human Services is building up a stockpile of smallpox and anthrax vaccines, working with states to improve early-warning disease networks, and taking other steps to prevent or respond to bioterrorist threats. D.A. Henderson, director of the Office of Public Health Preparedness, an arm of HHS, said yesterday that the government is "in much, much better shape today than three months ago."

Henderson, a physician who led efforts to eliminate smallpox in 1977, said the study's casualty estimates were not out of the realm of possibility for smallpox and anthrax but that the prospect of a huge ebola attack was remote.

"Quite candidly, I think smallpox ranks way at the top," he said.

The Brookings scholars said the government should invest heavily in technology to identify and apprehend suspected terrorists before they can strike.

The report estimated that a biological attack in a major urban area could create $750 billion in economic damage, and that widespread terror against a key part of the economy -- such as shopping malls or movie theaters -- could cost $250 billion.

The White House is seeking about $38 billion in the fiscal 2003 budget for homeland security, including $10.6 billion for border security, $5.9 billion to defend against bioterrorism, $3.5 billion for local police, firefighters and other emergency responders, $4.8 billion for aviation security and $722 million for new technology. Ridge has said the amounts are but a "down payment" in a multiyear plan.

The Brookings study said even that amount isn't enough.

Shoring up security will likely cost the government $45 billion a year, the report said, adding that private industry will need to spend up to $10 billion annually. In some cases, new regulations will be required to bring the private sector in line, the report said; in others, lower insurance rates or other incentives could be offered.

Economic specialist Peter R. Orszag, another team member, said the group sought to identify the "most glaring vulnerabilities" to help frame public debate.

Called "Protecting the American Homeland," the report credits Ridge and the White House for setting many sound priorities, but urged more spending on information systems for law enforcement. It also recommended significantly higher spending on air defenses, cargo security, food safety and cyber-security. More must be done, the report added, to protect the nation's 12,000 chemical facilities and 103 nuclear power plants, and to shield air-intake systems of skyscrapers from biological or chemical agents.

In recent months, Henderson and other government officials have warned about many of the same threats. Customs Commissioner Robert C. Bonner, for example, has said that the detonation of a nuclear device hidden in a ship's cargo container would cause massive damage and indefinitely shut down the shipping industry. Bonner said the United States must win agreements with other countries that have "megaports" in which cargo is checked at the point of origin (UCLA, 2002).

Title: Officials Warned On Bioterror
Date: May 8, 2002
Source: LA Times

Abstract: A leading expert on chemical and biological warfare warned Tuesday that local officials must do far more to prepare hospitals and fire and police departments for terrorist attacks that could occur with little notice.

Amy E. Smithson of the nonprofit Henry L. Stimson Center in Washington, D.C., delivered the keynote speech at a three-day state-sponsored conference in the City of Industry on disaster preparedness. About 400 police, fire and public health officials attended.

Smithson said New York is far ahead of most other American cities in establishing a system to recognize the first indications of a biological attack through quick identification of new patterns of medicine purchases by sick people, emergency room admissions or calls to emergency lines. The United States is probably not on the verge of a massive chemical or biological attack, Smithson said.

Attacks that have occurred, such as those last year involving anthrax-laced mail, probably did not represent any attempt to kill people in large numbers, she said, and the threat could take decades to be realized.

Nonetheless, she said, "we know that Al Qaeda wants to kill people," and it is necessary to be ready.

The hospital system, she said, is not prepared at present to cope with large numbers of people, in the hundreds or thousands, descending on facilities to get treatment or preventive medicines in case smallpox or even more exotic diseases strike.

She said that fire and police departments must prepare to assist hospitals in handling large groups of distressed people and that it might even be a good idea to prepare to use fast-food chain restaurants to dispense preventive medicine at drive-through windows (LA Times, 2002).

Title: US Mulls Development Of Counter - Terror Technologies
Date: May 29, 2002
Source: UCLA

Abstract: The Bush administration is wrestling with how to spur development of counter-terrorism technologies to cope with post-Sept. 11 threats, including new vaccines against potential germ warfare agents, President Bush's science adviser said on Wednesday.

"All mechanisms are being explored," said John Marburger, director of the White House Office of Science and Technology Policy. He said he expected a mix of regulations, government procurements and industry incentives to emerge.

Marburger has been working closely with Tom Ridge, head of the White House Office of Homeland Security set up after the September attacks. Ridge is expected to release a report in July outlining long-term a homeland security strategy, including structures and mechanisms for dealing with chemical, biological and nuclear threats.

The pharmaceutical industry was "a very good example of an industry that requires something (from the government)" to coax out vaccines against smallpox and other biological warfare threats, he told reporters at a session organized by *New Technology Week*, a trade publication.

"In general, (countering) bioterrorism is difficult to support on the basis of the commercial market," Marburger said. "And so there's going to have to be something like a procurement or incentive here."

But industry also must rise to the challenge, said Lewis Branscomb, co-chair of an anti-terrorism technology panel sponsored by the National Academies. The panel is due to release the first phase of a science and technology counter-terrorism study late next month.

Venture capitalists taking part in a Washington networking fair said they were awaiting word from the government to guide their bets on emerging technologies.

"Does anybody have a clue as to what direction we really want to go with respect to bioterrorism?" asked Josh Fidler, a partner at Boulder Ventures Limited, which invests in biotechnology and life sciences initiatives and has about $250 million under management. "I don't think so. Not yet."

Robert Grady, managing partner of Carlyle Venture Partners, part of the Carlyle Group, one of the world's biggest private equity firms with $13.6 billion under management, said Sept. 11 had boosted interest in security-related investments, especially those with a track record of selling to defense contractors.

But investors can be "extremely, extremely selective" about what they're funding, he said. "And so only the best companies will bet funded by us and probably by anyone" (UCLA, 2002).

Title: As Monkeypox Rises, Smallpox Vaccines To Be Offered
Date: June 11, 2002
Source: UCLA

Abstract: Federal health officials are expected to announce today that smallpox vaccinations will be made available to certain people who have been exposed to prairie dogs and other animals infected with monkeypox in recent days.

Smallpox vaccine is considered the most dangerous of human immunizations, but it can protect against monkeypox.

The Centers for Disease Control and Prevention is expected to make the vaccinations available as an option to highly selected groups like health workers who care for patients with monkeypox, people who have been exposed to animals sick with monkeypox, veterinarians who care for animals suspected of having it and scientists investigating monkeypox.

The investigation of human monkeypox cases expanded to a fourth state, northern New Jersey, yesterday as the number of suspected monkeypox cases rose to 50: 23 in Indiana, 20 in Wisconsin, 6 in Illinois and 1 in New Jersey. No one has died.

The total is more than double the 23 cases reported in three states when the disease centers urgently announced the outbreak over the weekend. The increase in cases under investigation has resulted largely from widespread publicity that led people to report rashes and illness to health officials, officials of the centers in Atlanta said.

The monkeypox cases are the first detected in the Americas. Most suspected cases had direct contact with prairie dogs or at work in veterinarian offices and pet shops.

Monkeypox patients typically fall ill with signs and symptoms like fever, headaches, dry cough, swollen lymph nodes, chills and drenching sweats.

One to 10 days later, patients develop rashes consisting of blisterlike pimples that filled with pus, broke open and produced scabs.

The rash often erupts in different stages, or crops, as it appeared on the head, trunk and arms and legs.

The Centers for Disease Control and Prevention is also expected today to announce a definition of human monkeypox, which would be critical in determining who would be eligible for smallpox vaccinations as well as investigating the outbreak.

United States officials stopped routine smallpox vaccinations in 1970, about a decade before eradication of smallpox from the world.

On Monday, a subgroup of a national panel of immunization experts appointed by the Centers for Disease Control and Prevention to serve on its Advisory Committee on Immunization Practices began discussions on whether and how the smallpox vaccine might be used.

Discussions focused on the benefits and risks of smallpox vaccine for monkeypox, a viral disease that can be fatal in 10 percent of human cases. The death rate for smallpox was about 30 percent.

But smallpox vaccination can also be fatal. Studies from the 1960's, when smallpox vaccinations were routine, found that for every million people older than 1 year old who were vaccinated, 1 or 2 died, 9 suffered from brain infection and more than 100 developed eczema vaccinatum, a severe illness and skin rash that can leave deep scars and can occasionally be life-threatening.

The government owns all the smallpox vaccine in the United States. This year, the government began offering it to health care workers to protect against any cases that might result from an attack in which terrorists released the virus.

The only known stocks of smallpox virus are kept at the Centers for Disease Control and Prevention and in Russia, both with the approval of the World Health Organization.

But the Bush administration has warned that Iraq as well as other countries and rogue groups might have obtained smallpox virus from the official stores in Russia and begun a program to vaccinate health care workers before the war began against Iraq.

The number of people for whom smallpox vaccine might be offered to protect against monkeypox would be small, the panel's chairman, Dr. John F. Modlin, said in an interview before the panel's meeting (UCLA, 2003).

Title: Filtering Out Bioterrorism
Date: June 20, 2002
Source: UCLA

Abstract: Invention: A Hopkins scientist has early success with his device, designed to remove anthrax spores, viruses and bacteria from the air.

The first place Richard S. Potember went in his quest to kill anthrax was to the dump.

The chemist at the Johns Hopkins University Applied Physics Laboratory in Laurel had mapped a system that could fit in an air conditioner or heater and that would destroy anthrax spores, viruses and bacteria in building vents.

Rather than buy a new air conditioner or heater, Potember rooted through the back of an air-conditioning store until he found a dirty, broken heating unit that fit his needs.

"Why build something expensive when you can find something cheap?" he said.

Early results show that Potember's invention, which eliminates foreign objects with ozone and ultraviolet light, has the potential to kill 100 percent of the viruses and bacteria that a terrorist might dump into a building vent.

The machine also kills or filters out more than 99 percent of spores that resemble anthrax in early tests.

Now Potember is preparing to move into a new lab modeled after an office building to test his machine in a real-world environment. If that research goes well, the device could be available commercially within a year and fill a gaping hole in homeland security.

Although he is not aware of the specifics of Potember's project, Bruce Clements, the associate director of the Center for the Study of Bioterrorism and Emerging Infections at St. Louis University, says technology that protects against airborne threats is "absolutely critical and needs to be developed, especially for high-risk buildings."

Potember began working on the project nearly a year ago with three objectives: He wanted the system to be simple, lethal and cheap.

"If it's supposed to protect the public, regular people have to be able to use it," he said.

A self-professed tinkerer who will strip down his old toasters for spare parts, Potember began fiddling in his lab amid piles of screws, discarded machines and charts.

"Some scientists need to be behind a desk, writing code," he said, standing in the middle of the cramped space that looks more like a pack rat's garage than a high-tech lab. "I need to be in the lab."

After several months of planning and building, Potember came up with a device that is made entirely from commercially available materials and is relatively straightforward.

Air runs through a filter before entering a chamber, where it is doused with ozone, high intensity UV light and water, a combination that has proved effective in early testing.

Although ozone is toxic, it has a relatively short life span and decays into oxygen within 30 minutes.

Potember estimates that it would cost $5,000 to assemble a machine, although that could rise or fall depending on the size of the structure it serves.

Despite his advances, Potember worked in relative anonymity until fall. But when anthrax was discovered in post offices and government buildings, the frightening incidents showed how simple it is to distribute the deadly spores. Many security experts speculated about how easy it would be for a terrorist to dump biological weapons into building vents, where they would be circulated.

Potember was inundated with calls from air-conditioning contractors and others who were aware of his work because of earlier research contacts.

The anthrax attacks "showed that [more effective] technology had to be developed," said Kevin Holland, a spokesman for the 4,000-member Air Conditioning Contractors of America.

Now officials at the Hopkins lab hope Potember will prove to be the man with the answer. Because of the attention on bioterrorism, lab managers have put his project on the fast track.

Potember will be moving his experiment into a lab with a ventilation system to see if the system works on a larger scale. The lab is also equipped with three office cubicles so Potember can see how particles are distributed.

Potember applied for a patent on his device in February, and lab officials are negotiating with a number of companies who might manufacture the devices to market commercially.

"It looks like it's a real killer [of spores and viruses] and it's not expensive, so all those things together make it pretty darn interesting," said John Bacon, a manager for technology transfer at the lab.

Although much of the push behind the machine is based on its potential to fight bioterrorism, Potember and others believe it also could play an important role in hospitals by cutting down on potentially deadly airborne diseases.

While workers put the finishing touches on Potember's lab, he is eagerly awaiting a chance to put his machine to the test. Walking through the room, he put his hand on a duct and said with a smile: "It's time to see what this thing can really do" (UCLA, 2002).

Title: Tensions Between CDC, White House
Date: July 1, 2002
Source: UCLA

Abstract: Health Officials Say Low Morale Could Threaten Agency's Ability to Handle Crises

The federal Centers for Disease Control and Prevention in Atlanta has been weakened and demoralized by tensions with Bush administration officials in Washington, according to a number of current and former officials at the nation's top public health agency.

The low morale is causing deep concern among public health experts around the country that the problems will hinder the CDC at a crucial moment -- when the agency should be leading the nation's effort to counter bioterrorism and other health threats.

The tensions stem from a variety of factors, including fallout from widespread criticism of how federal health officials handled last fall's anthrax attacks, the absence of a CDC director since March, efforts by the new administration to change approaches to controversial issues such as sex education and HIV prevention, and a campaign to exert more control over the CDC from Washington, health experts said.

"The absence of leadership ... and the micromanagement of things, from press releases to travel authorizations, have created a hunkered-down mentality among the CDC staff I've talked to," said Willard Cates, president of Family Health International, a North Carolina research organization that works closely with the CDC.

Top officials at the CDC and at the Department of Health and Human Services, which oversees the agency, deny that there is a crisis at the CDC and attribute any tensions to the normal process of adjusting to a new administration.

"We are in a transition period ... [but] the agency is moving forward," said David W. Fleming, acting CDC director. "There is a long-standing esprit de corps, and that never changes... . People are doing what they need to be doing."

As the federal agency responsible for protecting public health, the CDC takes a lead role in responding to epidemics and health emergencies. Its work has ranged from eradicating infections once common in the United States, such as smallpox and measles, to investigating outbreaks of food poisoning and fighting re-emerging diseases such as tuberculosis, or newer ones such as AIDS and West Nile encephalitis.

In the past, the CDC has often acted with considerable autonomy from Washington, even though some of its programs to prevent disease and injury touch on politically sensitive issues, such as condom promotion and gun control. Indeed, the agency, which has more than 8,000 employees, has long had a reputation for attracting health activists and is viewed as a headstrong outsider by many in the Washington health bureaucracy.

Since taking office, HHS Secretary Tommy G. Thompson has moved to centralize control over the department's 11 agencies, including the CDC. Criticism of health officials for giving conflicting advice during last fall's anthrax outbreak apparently strengthened the determination of Thompson and other officials to rein in the agency.

A number of CDC employees said that, in recent months, they have frequently been exhorted by HHS officials to make sure that the department speaks with "one voice," an approach that some fear may stifle scientific debate, especially on controversial topics.

Contact with the media is strictly monitored by the HHS press office. Many people interviewed for this article declined to be identified, saying they did not want to get themselves or colleagues into trouble.

"The whole issue of speaking with one voice has become a major problem, because it means that one voice will be a political voice," said a former CDC official. "Technical agencies remain credible if they

are free to act on the basis of the best scientific information available, and not on the basis of what is the most politically favorable option."

Other factors have also contributed to the tension between the CDC and HHS, sources said. D.A. Henderson, who joined the department last November as head of HHS's new Office of Public Health Preparedness and is currently Thompson's principal science adviser for public health preparedness, once worked at the CDC but reportedly feuded with the agency on various occasions later in his career.

HHS officials have ordered audits of many CDC programs and are requiring departmental approval for decisions, such as the hiring of top staff members and travel by employees to scientific conferences, that in the past were usually made within the agency.

Workers given the task of responding to departmental audits are taken away from other public health activities, a CDC employee said. "The approach could have been to say, 'Here is Secretary Thompson's view of this,' " the employee said. "Instead they say, 'We're going to do an audit. Make sure you do things the right way. We're not going to tell you what the right way is. Guess what we're thinking.' "

International travel requests, as well as domestic trips by more than five CDC employees to the same destination, now require departmental approval, generally at least six weeks in advance. Kenneth Castro, director of the CDC's division of tuberculosis elimination, said similar rules on overseas travel were enforced at times during the Clinton administration. He said the long lead time sometimes makes it difficult to send CDC experts to international meetings.

"Very often our overseas partners have only thought of a meeting three weeks ahead," he said. While the rules can be waived in emergencies, recently "there have been a couple of decisions that have been down to the wire. Those have been difficult."

Moreover, since the resignation of Jeffrey P. Koplan as CDC director in March, the agency has been run by a four-person interim team, leaving employees uncertain who will be the CDC's next leader. "If they appoint someone as the next head who is clearly a political hack, people will leave in droves," a former federal health official predicted.

In interviews, two of the CDC's interim managers disputed the claim that tense relations with HHS headquarters have damaged morale or affected productivity.

"I think the relationship ... is actually in one of the most collaborative and professionally positive modes that I've seen in many years," said Michael Osterholm, a special adviser to the HHS Office of Public Health Preparedness whom Thompson appointed to the CDC management team.

Fleming, the CDC's acting director, said that rather than stifling scientific discussion, the department's emphasis on "one voice" has promoted greater interchange between the CDC and other federal health agencies. "Once policy decisions are made, it's all of our jobs to support them," he said.

It is common for a new administration to focus on high-profile activities such as travel and hiring, he said. Fleming said CDC and HHS officials are looking at ways to streamline the process.

Fleming acknowledged that many CDC programs have undergone audits but said they have not created problems. "We do a very good job here," he said. "The more that we can have people from the department or people from other parts of the government see what it is we are doing, the better off we're going to be."

The June 6 announcement that more than $900 million in federal grants would be made available to state and local health departments for bioterrorism preparedness is evidence that the CDC and HHS are cooperating efficiently, Osterholm said. States' plans for spending the money were evaluated within seven weeks by the CDC, the Health Resources and Services Administration and HHS headquarters.

"You can't cut through all the red tape if you have parties that aren't working closely together," Osterholm said.

But there is uncertainty at the agency over what impact the emphasis on bioterrorism preparedness -- and the administration's recently announced plan for a new Department of Homeland Security -- will have on the funding of public health programs. Under the proposal, much of the CDC's responsibility for protecting against bioterrorist attacks would be moved to the new agency.

Following the Sept. 11 attacks, Congress passed an emergency supplemental appropriation that boosted the CDC's fiscal 2002 budget to $6.8 billion. It included about $1 billion for terrorism preparedness to be distributed by the CDC to state and local public health agencies, as well as more than $1 billion for purchases of smallpox vaccine and drugs. The president's $5.8 billion budget request for the CDC for fiscal 2003 contains about $1.6 billion for the agency's bioterrorism efforts but would cut overall funding to other CDC programs by about 4 percent.

HHS spokesman William Pierce said the proposed budget contains money to expand the agency's infectious-disease laboratories in Atlanta and Fort Collins, Colo., as well as funds for needed building repairs, a new communications center and increased security. He said Thompson has been trying to consolidate research programs and reduce the duplication of efforts among various HHS agencies. In some areas, "that might mean less for CDC, but not less on health issues department-wide," he said.

Koplan, the former CDC director, said he was concerned about the impact of the proposed new department on the CDC's role. Much of the funding that the agency has received for bioterrorism preparedness is to rebuild and strengthen state and local public health departments, diagnostic laboratories and communications networks that are also critical to combating everyday diseases.

"There are elements of what we do at CDC that could be carved out" as exclusively related to bioterrorism, Koplan said. "There are many other things that naturally overlap... . The country needs to be prepared for both naturally occurring plague and the potential for bioterrorist use of plague."

Koplan and others said the CDC continues to attract highly qualified doctors and scientists. The key to its future will be whether it can keep them.

"Can it be improved upon? Always," Koplan said. "But I think it's got lots of talented, smart people who have done well by the country for many decades. I hope that they will be in an environment that encourages use of top-quality science to inform public health decisions" (CDC, 2002).

Title: Researcher Shows How Terrorists Could Create Deadly Pathogens
Date: July 12, 2002
Source: UCLA

Abstract: After laboring for more than a year to make polio virus from scratch, researcher Jeronimo Cello telephoned a scientific supply company in Iowa and ordered two long pieces of ready-made DNA. A few weeks after the pieces arrived in the mail, he became the first person to produce a simple form of life using only written genetic code as a starting point.

But Dr. Cello's success has some people worried. Terrorists, they say, could use similar techniques to create deadly pathogens simply by locating the gene data on the Internet and then ordering the materials through the mail. Eckard Wimmer, a virologist at the State University of New York at Stony Brook who oversaw Dr. Cello's work, says that the terrorists could synthesize other simple viruses, including the flu, HIV and Ebola, and eventually perhaps more sophisticated pathogens like smallpox . "Any well-trained graduate student could do it," Dr. Wimmer says.

The journal Science is publishing the polio-making recipe Friday, prompting criticism from some scientists. "I think this is irresponsible," says J. Craig Venter, formerly the head of the gene-sequencing company Celera Genomics Group and now the head of a nonprofit think tank in Rockville, Md. He says the work represents only a minor technical achievement but carries an alarmist message

that could frighten the public and prompt legislators to put more controls on basic research. "It has the chance to hurt the entire scientific community," he says.

The polio project also raises important philosophical questions. Although viruses are considered a marginal form of life because they can't survive apart from a host, this appears to be the first time that scientists have created any life form in the laboratory starting only from a written blueprint of DNA letters.

Independent scientists agree that similar techniques could probably be used to make other viruses, but they question whether it would be possible to create more complex life forms such as bacteria, plants and animals. "The simplest bacteria has a million times more DNA than a virus, so it's a practical issue. But it does make you wonder if you could make something larger," says Ross Durland, head of research at Chromos Molecular Systems Inc. of British Columbia, which is studying how to use synthetic genes for medical purposes.

Dr. Wimmer says his work was supported starting in 1999 with about $160,000 from the Department of Defense's Advanced Research Projects Agency, which is known for funding blue-sky scientific projects with potential military consequences. Dr. Wimmer says he was serving as an adviser to the agency, known as Darpa, when administrators decided to fund his project as part of a program to study next-generation defenses against biological weapons.

But Darpa didn't disclose that the polio project was among its grants under the program, called the Unconventional Pathogen Countermeasures program. Dr. Wimmer says he isn't sure why the agency kept the project secret. A Darpa spokesman said not all the agency's work is posted on its Web site.

"It looks like the age of synthetic bioweapons is upon us," says Edward Hammond of the Sunshine Project, a nonprofit organization that monitors U.S. compliance with the international Biological and Toxin Weapons Convention, which bars the development of germ-based weapons. Mr. Hammond says the international community has been slow to recognize the threat posed by lab manipulations of viruses and other organisms.

Thanks to near-universal vaccination, the polio virus poses little danger in the hands of bioterrorists or others. According to the World Health Organization in Geneva, there were 600 cases of the paralyzing disease poliomyelitis in 10 countries in 2001, and the group has set 2005 as a target for wiping out the disease.

Recently, some public health officials have argued for the eradication of the known remaining stores of conquered viruses such as smallpox , samples of which are stored at the Centers for Disease Control and Prevention in Atlanta and in Russia, in order to permanently remove such threats. Experts say Dr. Wimmer's work appears to render such debates moot, because the genetic sequence of smallpox and other pathogens have already appeared on the Internet.

Dr. Cello began the SUNY project in 1999 after he joined Dr. Wimmer's laboratory from Argentina as a junior research scientist. He says the project was supposed to hone his skills in molecular biology and was only expected to take a few months.

Working alone, Dr. Cello began attempting to stitch together a complete copy of the 7,500 chemical units that make up polio's genetic complement. It was already known that genes copied from a live virus could produce new viral particles after being injected into a human cell. Dr. Cello's goal was to start with a copy of the genome synthesized out of DNA building blocks in the laboratory and build the chain piece by piece.

But building up the long chain of DNA from smaller pieces proved frustratingly difficult. Eventually, Dr. Cello simply ordered most of the completed sequence from a scientific supply house, Integrated DNA Technologies of Coralville, Iowa.

Like other viruses, polio virus unleashes its genetic payload into a human cell and then takes over the cell's machinery to make more copies of itself. With the viral genome in hand, Dr. Cello was able to harness that process to make millions of copies of live virus.

To help keep the laboratory ingredients out of terrorists' hands, Dr. Wimmer suggests that companies selling synthetic DNA should check orders against public databanks to identify any customers ordering sequences that match up with deadly microbes (UCLA, 2002).

Title: CDC Says They're Prepared To Handle Bioterrorism
Date: August 28, 2002
Source: UCLA

Abstract: The Centers for Disease Control and Prevention says it is better prepared to handle the threat of terrorism following the September 11 attacks.

CDC director Julie Gerberding said September 11 changed the world. Then, less than a month later, the nation was thrust into the height of the anthrax scare.

"The world changed for all of us, including the CDC," Gerberding said a conference Tuesday on terrorism preparedness. "We learned a lot of lessons last fall. We have been scaling up ... and streamlining our operation. We're better prepared than we were a year ago, but we are not done yet."

According to officials, $918 million will be used next year for improvements to state and local health departments. The West Nile virus outbreak, now identified in 20 states and the nation's capital, has been an opportunity to practice public health response and implement operations, communications and leadership strategies similar to those that would be used in terrorist attacks.

Though the agency has stepped up its level of terrorism preparedness, it hasn't forsaken other public health concerns, Gerberding added.

"We are not taking away from other programs to enhance our terrorism efforts," Gerberding said. "We are not complacent about the threats we face. We're building terrorist capacity on the foundation of public health."

Improvements have been made to areas of radiation risks, chemical residues, drug stockpiles, and emergency response, CDC officials said. Priority has been placed on education for health care workers regarding anthrax, smallpox and other diseases.

"The anthrax attack was unprecedented, and could've been much worse and more complicated, but we're putting the lessons we learned from that to use," said James Hughes, director of the CDC's National Center for Infectious Diseases.

Kathleen Rest, Deputy Director of CDC's National Institute for Occupational Safety and Health, said the World Trade Center and anthrax attacks also highlighted the importance of worker safety and health.

"These people face illness, injury and death on the job, and it's up to us to make sure emergency responders have the tools they need to protect themselves and do their jobs," she said (UCLA, 2002).

Title: Quiet Federal Disease Lab Has New Mission After 9/11
Date: September 2, 2002
Source: UCLA

Abstract: If not for the shiny new security fence, the nondescript building would fade into the neutral shades of the foothills behind it.

In fact there's not even a sign to identify the Centers for Disease Control outpost in the war against bioterrorism. The Division of Vector-Borne Infectious Diseases, the CDC's only lab outside of Atlanta, is just another building on the Colorado State University's quiet Foothills Campus - past the equine research stables and the ducks on College Lake and before the expensive new houses on the south side of the campus.

Vistors are told to look for the guard shack.

"We've been out here for 35 years, just quietly going about our work," said Duane Gubler, director of the Fort Collins lab. "Nobody even really knew what we were doing out here.

"But that has certainly changed."

The lab's primary responsibility is researching and monitoring naturally occurring plague and other diseases transmitted by mosquitoes, ticks, and fleas. Work done at the lab has become an important weapon in the fight against both man-made bioterrorism and the naturally occurring West Nile virus.

"It's the same as in any business; there are things we've been plugging along on," Gubler said. "BT [bioterrorism] was one of those things until 9/11. Now it's our top priority."

Of the lab's 172 employees, perhaps the busiest is Dr. Lyle Petersen, associate director for medical science. The physician and epidemiologist came to the facility three years ago to focus on West Nile research. A couple of weeks before the events of Sept. 11, he volunteered to head up the bioterrorism unit.

Petersen, the CDC's spokesman at the lab, previously was involved in setting up Germany's disease control center. Prior to that, he worked with the CDC in Connecticut. He headed up the investigation of the New York City anthrax contamination last fall.

"When I moved to Colorado, nobody had even heard of West Nile," he said. "On the East Coast, everybody was familiar with it, but out West it was like, `What's that?"'

While Petersen said that he and his fellow researchers were anticipating a larger West Nile outbreak this year than in the past, he has been surprised by how quickly the infection has spread.

"Part of the problem is that every single human is susceptible," he said. "Because people haven't been exposed to it before, no one has built up an immunity."

Vector-borne diseases, in general, went off the radar screen about 30 years ago, Petersen said. As a result, fewer people went into that field, and now the country is short on expertise on such illnesses and the infrastructure to deal with them.

"I wouldn't say it's a weakness, but we definitely have some catching up to do," Gubler said.

Before the emphasis on West Nile research and bioterrorism preparedness began in 1999, the Fort Collins lab was focusing on dengue, a mosquito-borne illness which kills hundreds around the world annually, and Lyme disease, the tick-borne illness which can damage the joints and nervous system.

"Because we are responsible for three of the top 10 agents of concern, we've really become the hub for bioterrorism," Gubler said.

Two of those agents, tularemia and plague, are "Class A," meaning they are of top concern.

Plague, transmitted by rodent fleas, was the Black Death that killed millions in Europe during the Middle Ages. Modern antibiotics are effective against plague, but if an infected person is not treated promptly, the disease is likely to cause severe illness or death. Tularemia is a plague-like disease that is transmitted by the bite of a tick or a flea or by consumption of contaminated food or water.

The third potential bioterrorism agent tracked and studied in Fort Collins is Venezuelan equine encephalitis. Rarely fatal and difficult to spread, the disease is thought to be an unlikely choice for bioterrorists.

In addition to monitoring these agents, the division is working on tests to limit the spread of viral weapons and determine their origin.

The division was established in Logan, Utah, in the 1950s as the Disease Ecology Section of the CDC to deal with forms of viral encephalitis transmitted by mosquitoes in the Western United States.

In 1963, the unit moved to Greeley, Colo., and in 1967 to its present location in Fort Collins. The plague program was moved from San Francisco to the unit at that time. In 1974, the name was changed to the Division of Vector-Borne Viral Diseases. In 1989, it was renamed the Division of Vector-Borne Infectious Diseases to reflect its responsibilities for Lyme disease, plague, and other bacterial infections.

Given its increasingly important role and the deteriorating condition of the 35-year-old building it is housed in, the division is in line for a new lab. The president's budget for the coming fiscal year includes $74 million for a new Fort Collins facility.

The building serving 172 was designed for 50. There is a waiting list to use the most secure labs and 70 offices have been located in modular trailers.

"The past five years or so, our requests weren't given that much consideration," said Mary Ellen Fernandez, a deputy director of the division. "But now it looks like we're going to get the new building we need.

"I guess there are some advantages to being noticed" (UCLA; 2002).

Title: Gearing For Bioterror
Date: September 8, 2002
Source: UCLA

Abstract: When Dr. David Ackman started his new job in January 2001, he expected that serving as health commissioner for Nassau County would be a fairly low-key task.

That was, of course, before the affluent Long Island county's bond rating fell to near-junk status. Before two jets slammed into the World Trade Center. And, most significant to Ackman and his public health colleagues nationwide, it was before Robert Stevens (case 5) died on Oct. 5 of inhalational anthrax.

"I don't think we consider ourselves a major terrorism target," Ackman said. "But it does skew what we do here . . . I'm called upon to spend a lot of time thinking about bioterrorism."

It's hard to imagine what might constitute a target for germ warfare in Nassau County, but it does lie in the shadow of the biggest target of all: New York City. And that leads to several nightmarish suburban scenarios.

"There could be a letter \[contaminated by anthrax\] passing through the postal system on Long Island," Ackman ticked off. "Second, there could be exposures in New York City, and some people who work there live here in Nassau. Or there could be an aerosol release in New York City, and the prevailing winds carry it into Nassau County."

So Ackman has to take the threat of bioterrorism seriously. Responding to Sept. 11 and anthrax fears last fall cost his department more than $100,000, Ackman said, about $85,000 of which was eventually covered by federal emergency funds. During the summer the county received $1.3 million more from the federal Centers for Disease Control and Prevention for bioterrorism preparedness, and it will be Ackman's task to determine how best to spend the funds.

"But emergency preparedness planning is something we have no preparation for. Nobody in Nassau County even knew what 'incident command' meant six months ago," Ackman said. "Nobody's really decided what we have to prepare for. How big? How many cases?"

Somewhat arbitrarily, he conceded, Ackman set preparedness targets. By the end of 2003 he wants the department ready, within 36 hours of realization that a germ attack has been unleashed upon New York City or within Nassau, to "be able to treat up to 10,000 people with prophylactic medicines over a 48-hour period."

Having said that, Ackman asked, "Is that sufficient? Or too much? I don't know. Nobody's really told us what a place like Nassau County should be prepared for. We're making the best guess, and we'll go ahead, practice our bioterrorism drills, and in all probability never have to use it."

All over the country, health commissioners are trying to reckon what threats, realistically, loom over their communities and how best to juggle their typically shrinking non-bioterrorism budgets and staffs to protect the people whose health is their responsibility.

Ackman's counterpart in nearby Westchester County thinks everybody is overreacting, and he has no plans for such contingencies as large-scale quarantines. But his colleague in upstate Onondaga County is preparing for worst-case scenarios - a level of commitment that requires five full-time staffers and a budget for the cash-starved county of more than a million dollars.

Boston is spending about 10 percent of its public health resources on bioterrorism preparedness. And Los Angeles County, which for the second time in 10 years faces possible bankruptcy, is trying to find a cheap way to protect the nation's most expansive metropolis.

Who has it right?

It doesn't help, of course, that no one can really define the challenge. At a time when Congress is scrutinizing alleged failures to protect Americans on the parts of the FBI, CIA and National Security Agency, public health leaders are acutely aware of the political dangers. Dr. Alfred Sommer, dean of the Bloomberg School of Public Health at Johns Hopkins University, said in an interview, "You can't expect complete safety, no matter how many billions are poured into public health. The question is, how much safety is enough safety, from a legal, political or moral point of view?"

It's a public health gamble, a game of terrorism roulette.

Over seven months *Newsday* has interviewed local public health leaders across the nation to see how they plan to protect the American people from biological terrorism. *Newsday* found them deeply troubled by their charge. All expressed pleasure at the nearly $2.5 billion the federal government is expected to dole out in the coming months for local public health preparedness. But, without exception, they worry that beleaguered public health systems, most facing cutbacks in non-bioterrorism budgets due to severe deficits in at least 40 states, will not be able to meet the challenge.

One top-level federal health official who spoke on condition of anonymity said that Health and Human Services Secretary Tommy Thompson has become enraged when challenged by staffers to offer detailed guidance to local authorities. He has repeatedly told his inner staff that the key mission is to get the federal dollars out to the states - let local officials decide what their threats may be and how best to spend the money.

"Potentially any \[germ\] agent could be a bioterrorist threat that is used in a deliberate manner to cause illness or social disruption," Dr. Ernest Takafuji said. Takafuji recently retired as a colonel in the U.S.

Army, focused on bioterrorism. Now he guides National Institutes of Health bioterrorism research agendas.

"Influenza is probably one of the best biological warfare agents we could be facing," Takafuji said. Influenza is far more contagious than smallpox, the current focus of HHS preparedness. And rare, super-virulent strains of flu, such as the one that killed 25 million people worldwide in 1918, would pose a challenge far exceeding anything the health system is currently equipped to handle.

Should the goalposts for bioterrorism preparedness be set far enough for health commissioners to handle a 1918-style superkiller influenza? Maybe, officials say, but first public health needs to achieve far less ambitious goals.

Dr. Frederick Burkle of the Defense Threat Reduction Agency at Johns Hopkins University said America's public health lacks "a real-time modern disease surveillance system" that can spot either naturally arising or terrorist disease threats. Though all local health departments and the CDC have surveillance systems, Burkle said, "there's so much noise we can hardly pick up the signal."

"We have no baseline epidemiology of infectious diseases," Burkle said. "We just don't know what the normal or background rates of infectious diseases are." Without knowing what "noise" is normal, disease trackers are hard-pressed to spot new threats.

In the absence of such information, the CDC is encouraging local public health leaders to develop systems of syndromic surveillance, which could allow them at least to notice increases in emergency room cases of illnesses that seem to involve symptoms similar to those produced by biological weapons.

Syndromic surveillance was first used extensively by New York City health officials to track the 1999 West Nile virus outbreak and is now being used nationwide to spot cases of that disease. It is swiftly becoming a mainstay of bioterrorism preparedness nationwide.

That has prompted a rash of false alarms, as doctors, trained to spot such syndromes, leap to conclusions they would never have considered before Sept. 11. On Aug. 4, for example, an emergency room physician at the Kings Highway Division of Beth Israel Hospital in Brooklyn decided that a young man with fever and a skin rash fit the description for smallpox. New York City's emergency response system was activated over what turned out to be a mild case of contact dermititis.

Dr. Julie Gerberding, director of the CDC, said her agency "loves those false alerts because it tells us clinicians are alert and are paying attention."

Not everybody is thrilled.

"Syndromic diagnosis - that's nothing but a big charade," said Dr. C.J. Peters of the University of Texas Medical Branch in Galveston, who formerly headed the CDC's top security lab and, decades ago, was part of the Army's bioweapons defense research program.

"By the time you start getting blips in emergency rooms, it's too late," Peters insisted. Surveillance systems have to focus on spotting the microbes, themselves, before people have incubated germs in their bodies for several days and started an epidemic, he said. But regardless of how surveillance is focused, the current system is inadequate, all experts agree.

Last fall's anthrax-spiked letters sparked a wave of public anxiety worldwide that overwhelmed public health laboratories in nearly every nation. In the United States local health departments and state and federal labs processed an astounding 125,000 human specimens that were suspected of containing anthrax, and more than 1 million environmental samples, according to Dr. James Hughes, director of the

CDC's National Center for Infectious Diseases. If a genuinely contagious event occurred, the local burden would be exponentially greater.

So the mandate to prepare for such an event hits every community, large and remarkably small. "We are absolutely passionate about committing resources to remote areas," secretary Thompson said in a June 6 speech in New York City.

Health director Linda Lazzari's rural Essex County, N.Y., with a population of fewer than 40,000 spread over 1,800 square miles, is best known for its pastoral scenery and access to Lake Champlain. Its tiny health department, run by registered nurse Lazzari, is expected to devote time and resources to bioterrorism preparedness.

"Our budget has not been too affected, but our public health activities definitely have," Lazzari complained. "Our supervising nurse for preventive services spends almost all her time these days on bioterrorism. The same is true for myself. Between all these meetings I have been to and trainings I have attended on bioterrorism, I have had little time to spend on other programs and activities."

The question Lazzari faces is, if her prevention nurse hasn't got time to deal with school cafeteria inspections or child vaccine programs because she's swamped with bioterrorism meetings, is that in the best interests of the residents of rural Essex County?

In addition, all health departments worry that the federal bioterrorism funds will dry up in a year or two, which would force officials to lay off the very scientists and technicians they are now trying to hire. Many health administrators are trying to borrow personnel from other programs, rather than hire new ones.

At the other end of the scale is New York City, home to 8.5 million people and a clear target of terrorists. Due to plummeting tax revenues since Sept. 11, the state public health budget has been reduced, and the city, with its own budget deficit of about $5 billion, is in no position to offset those cuts. Mayor Michael Bloomberg has ordered a 12 percent slash in the city's health budget for this year and warns that further cuts will be necessary in the future. The biggest hits will be in such core programs as immigrant health, infant mortality prevention, tobacco control, HIV education, lead elimination and cancer programs.

The city has received more than $21 million for bioterrorism preparedness and expects that much again for next year. That makes bioterrorism the largest non-entitlement portion of the city's health department budget. City health officials insist they will try to build bioterrorism programs that offer protection against both natural and man-made epidemics. But they acknowledge that personnel from the full gamut of health programs have been involved in bioterrorism training and activities.

That basic dilemma - juggling finite, usually insufficient, resources against tremendous uncertainty - appears to be universal.

"If public health dollars are finite, we are very worried that funding for bioterrorism will come at the expense of other health programs," said Dr. Millie Svatek of the Suffolk County Department of Health Services. "It is essential that all bioterrorism money be viewed as additional money that will in the long run enhance all of public health" (UCLA, 2002).

Title: Many Worry That Nation Is Still Highly Vulnerable To Germ Attack
Date: September 9, 2002
Source: New York Times

Abstract: Although the Bush administration has invested hundreds of millions of dollars over the past year to strengthen the nation's defenses against a biological attack, experts say the United States remains highly vulnerable to bioterrorism, particularly strikes on the food supply.

The long-neglected public health system, which was stretched thin during the anthrax attacks of last fall, has received nearly $1 billion. States have used the money for plans to cope with a germ attack, and some are already hiring workers who can respond to intentional attacks or natural outbreaks of diseases like West Nile virus.

"Each day we are getting stronger," said Tommy G. Thompson, the secretary of health and human services. Even so, significant shortcomings remain.

Many experts, including Mr. Thompson, say the administration has not paid enough attention to protecting the plants and animals in the food supply from biological attacks. The Food and Drug Administration doubled the number of food inspectors, to 1,500, this year, but even so, Mr. Thompson said, the government is "woefully inadequate in this area." He called this his biggest concern.

Battles persist within the federal bureaucracy, particularly over the role of the new Department of Homeland Security in preparing for germ attacks. John J. Hamre, president of the Center for Strategic and International Studies, a research organization devoted to security, says the bioterrorism effort is still "years away" from being properly organized.

"We're better prepared as a society, but not necessarily as a government," said Mr. Hamre, a deputy secretary of defense in the Clinton administration.

Meanwhile, a deep philosophical divide has emerged between scientists and intelligence officials over whether to withhold scientific information in the name of national security. A case in point is a rift over a study on agricultural bioterrorism prepared by the National Research Council.

The report, a draft of which was obtained by *The New York Times*, says the government lacked a comprehensive plan to respond to agricultural bioterrorism. But it has yet to be published, its authors say, because of fears that it could aid potential terrorists.

"There's a possibility of it being literally classified," said Dr. Joshua Lederberg, a microbiologist and Nobel laureate who served on the committee that wrote the report. "Some people think it shouldn't be released."

So while government officials say considerable progress has been made against bioterrorism, they acknowledge that there is a long way to go.

"There are still some gaps," said Dr. Julie L. Gerberding, director of the Centers for Disease Control and Prevention. "There is a kind of mosaic of capacity right now."

While public health agencies have received a big lift, hospitals have received far less money from the federal government, and many hospital executives say they cannot afford to prepare for bioterrorism on their own.

Although the budget of the National Institutes of Health has grown considerably to accommodate more research into new drugs and vaccines, the next generation of therapeutics is still years away.

"That just doesn't happen overnight," said David Franz, former commander of the Army's bioterrorism defense laboratory in Fort Detrick, Md.

Indeed, Dr. Franz and others say, the biggest change has been one of attitude.

Doctors and nurses who have never seen a case of smallpox -- a disease that was eradicated two decades ago -- are now learning how to identify its distinctive rash and how to administer the vaccine, which has not been routinely given to Americans since 1972.

Health officials pay closer attention to infectious disease. For example, Dr. Georges Benjamin, who runs the Maryland health department, now has his staff compile a monthly e-mail report of disease outbreaks overseas.

"We didn't feel threatened by that before," said Dr. Benjamin, who is also president of the Association of State and Territorial Health Officials. "The world has changed. Every time we get an outbreak at all, the first question we ask is, `Was this intentional?' "

The Agencies: Boom Times

As director of the Iowa public health laboratory, Mary J. Gilchrist has long worried about germ attacks, but long had trouble getting colleagues interested.

"People thought I was from outer space," Dr. Gilchrist said.

Last year, her bioterrorism preparedness budget was scant: $100,000, all of it from the Centers for Disease Control and Prevention.

This year, with $1.5 million in federal bioterrorism money, Dr. Gilchrist is hiring laboratory workers and buying equipment to enable her technicians to conduct rapid tests on infectious agents. She says she worries that she will be unable to fill new positions because other public health agencies are also hiring.

"There's going to be a brain drain," Dr. Gilchrist predicted.

Bioterrorism has brought boom times to public health agencies. In January, President Bush signed a bill authorizing $1.1 billion for bioterrorism preparedness, with the bulk of it, $930 million, designated to be parceled out among the states for improvements in public health.

The Office of Public Health Preparedness, created by Mr. Thompson, reviewed state plans and had disbursed nearly all the money by June, said Jerome M. Hauer, the office's director and an assistant secretary.

Now the states must carry out their plans.

In Massachusetts, for example, Nancy Ridley, assistant commissioner of the state's Department of Public Health, said it took several months just to get officials in 351 local health departments to agree on how to divide the state into regions so the federal dollars could be distributed. "Everybody wants a piece of the pie," she said.

In Texas, Dr. Eduardo Sanchez, the commissioner of health, is trying to determine how to handle an attack that would involve the state's neighbor, Mexico. Could Mexican hospitals care for American patients, and vice versa? Would Mexicans be eligible for smallpox vaccine from the United States stockpile?

Dr. Rex Archer, the director of health for Kansas City, Mo., said: "We as a nation have not defined how well we want to protect our public. We have not said that we need to be able to manage a major bioterrorism attack in, say, 50 states, and keep the number of casualties down to a certain level. Until you do that, you can't see how adequate your staffing is."

The Hospitals: Getting Ready

The nation's hospitals are not nearly as far along as public health agencies in preparing for a bioterrorist attack, Mr. Hauer says. They received an extra $135 million from the federal government, he said, but

that is not enough. In his budget for 2003, President Bush has proposed $518 million for hospital preparedness.

A major concern is what experts call "surge capacity," the ability of hospitals to accommodate a sudden increase of patients. Mr. Thompson, the health secretary, says he wants each state to develop regional plans that would enable hospitals to handle an extra 500 patients on any given day this year, and 1,500 on any given day next year.

"Five hundred patients is feasible so long as people understand that not everybody is going to be in a hospital-style bed with all the accouterments," said James D. Bentley, a senior vice president at the American Hospital Association. "If we have to start using elementary schools or armories or other kinds of settings, that's what we will have to do."

Hospitals that ordinarily compete have begun joining forces. Dr. Paul Pepe, who runs the emergency department at Parkland Health and Hospital System in Dallas, said hospitals in the region were talking about "cross-credentialing" doctors so that they could treat patients anywhere.

"We're talking about buying in bulk, in economies of scale, with everybody participating," Dr. Pepe said. "Everybody is anteing up."

But, Mr. Bentley said: "There is a long way to go. It is going to probably take five years to get where we ought to be."

The Vaccines: Bolstering Supplies

As fear of anthrax swept the nation last fall, much of the public discussion about bioterrorism centered on the question of whether there would be enough drugs and vaccines to go around. Today, those worries have largely eased.

The biggest fear last fall was an insufficient supply of vaccine against smallpox. Mr. Thompson, the health secretary, signed contracts with two companies -- Acambis, a biotechnology concern, and Baxter, the pharmaceutical giant -- for a total of 209 million doses.

But in the interim, scientific studies have shown that the nation's existing stockpiles of smallpox vaccine could be diluted to provide 300 million doses, enough for every American to be inoculated, said Dr. Anthony S. Fauci, director of the National Institute for Allergy and Infectious Diseases, which did the work.

The existing vaccine is old -- some of it dates to 1952 -- so the government still intends to buy the new vaccine. But, Dr. Fauci said, "If we had an emergency tomorrow we'd be good to go."

Still unresolved is the question of whether the government should offer the vaccine to health care and emergency workers as a precaution against a bioterrorist attack. In June, a national advisory panel recommended vaccinating about 15,000 health care professionals.

The issue has proved a vexing and politically delicate one, because the vaccine is made from a live virus that itself can lead to fatal complications in people who receive it or come into contact with people who receive it. People with impaired immune systems are especially vulnerable. The decision now rests in the hands of the White House; Mr. Thompson said an announcement was expected by the end of the month. (The new vaccine is also made from a live virus, vaccinia, but under safer conditions.)

The Food Supply: Another Front

Many officials and scientists say bioterrorist threats to the nation's food supply have had too low a priority in the war against terrorism. Understandably, one administration official said, the government initially concentrated on countering threats to people, and the relative complacency about agriculture was partly a result of the nation's success in controlling disease.

"Most people take the programs for granted because we have been so well protected," Ann M. Veneman, the secretary of agriculture, said in an interview yesterday. But countering bioterrorist threats has the highest priority for her, she said. Since Sept. 11, with a $328 million budget appropriated by Congress, she has formed a homeland defense council to advise her and has taken other steps to reduce vulnerability, among them increasing border inspections and spending on research.

Critics say too little is still being done, partly because of bureaucratic inertia and a passion for secrecy at the top.

"There is a true crisis in agricultural biosecurity that stems in part from from hostility to the very notion of vulnerability at the top of the Department of Agriculture," said Thomas W. Frazier, president of GenCon, a nonprofit group that promotes scientific and educational projects affecting agriculture.

The issue is reflected in a dispute over the delayed release of the National Research Council's draft report, "Countering Agricultural Bioterrorism: A Framework for Action," commissioned by the government a year before the attacks but partly written after them.

The report warns that "gaps in biological and intelligence data on foreign-plant and foreign-animal pest and pathogens" and inadequate inspection at the nation's borders increase the chance that a terrorist armed with, say, foot-and-mouth virus or soybean rust could enter the country and deliberately spread diseases that could cripple the nation's livestock and plants.

It notes that only 1 percent of all private vehicles entering the country are inspected by the Agriculture Department. It concludes that the government has not developed "in-depth plans for defense against the intentional introduction of biological agents directed at agriculture."

Dr. E. William Colglazier, the executive director of the National Academy of Sciences, which conducted the study, said that lawyers for the Department of Agriculture and the White House's Office of Homeland Security had asked the the academy not to publish the report because it might give terrorists a "road map" to striking American agriculture.

Dr. Colglazier said the academy had been willing to omit from the published version of the study secret data or passages that could be harmful to national security, but the government had not identified such material. Scientists and other experts who worked on the study said it contained no secret information and the vulnerabilities it discusses could be found in publications on the Internet. He also said the academy planned to publish a version of the study, which it would edit.

Ms. Veneman said she had not read the report. But Alisa Harrison, an Agriculture Department spokeswoman, said her agency and the homeland security office had not requested that the report be suppressed.

At the same time, critics say, the government has been slow to spend money for initiatives like the creation of a new national laboratory network to detect infectious disease in animals.

Last year, Congress appropriated $23 million to plan the design of a new facility at Plum Island, off Long Island, the nation's only laboratory authorized to study and develop vaccines for such highly contagious animal diseases as foot and mouth. But nine months later, no design plans have been made. Agency

officials say Congress has insisted that first a new study must be completed on whether a new, higher-security lab should be built on the island or the mainland.

Anne K. Vidaver, chairwoman of the department of plant pathology at the University of Nebraska, said that plant research in general, despite the recent increases, remained underfinanced, and that federal and state labs communicate poorly with one another. In addition, she said, the response to a blight might be delayed by the Agriculture Department's concern about the effect of such a discovery on trade.

"The United States is not unique in this respect," Dr. Vidaver said, "but if soybean rust shows up tomorrow, we might be ordered not to talk about it."

Gordon D. Johndroe, a spokesman for the Office of Homeland Security, noted that President Bush listed bioterrorism prevention as one of his top four priorities this year, and that the White House had requested $7 billion for it in next year's budget.

He counseled patience as the government mobilizes for a long-term campaign against germs directed at people, plants and animals. "We're much better prepared than we were last fall," Mr. Johndroe said, "and we'll be twice as prepared a year from now as we are today."

Forewarned and Forearmed?

Most public health and intelligence officials agree that no matter how much money is spent, and how many plans are drawn, the nation will never be fully prepared for or protected against a biological attack.

"Prepare for what?" Dr. Benjamin, the Maryland health director, asked. "We are better prepared today to identify smallpox and anthrax than we were a year ago. There is still a whole list of organisms that we are not as prepared for."

In the end, experts say, the most important achievement since last September has been raising the nation's consciousness.

"Our biggest success is not related to vaccines or drugs," said Dr. Franz, the former Fort Detrick commander. "It is related to awareness: Awareness among physicians to think about unusual diseases. Awareness among emergency responders, that if it looks like the flu, maybe it isn't the flu. Awareness among law enforcement, and the guys that walk around in those white shirts in airports. I don't think they would let a sick person, maybe with smallpox, sit in an airport and cough on people. That's the big difference, and that is all education and experience" (New York Times, 2002).

Title: U.S. Makes Major Strides, Yet Much Work Remains, In Preparing For Bioterrorism
Date: September 18, 2002
Source: UCLA

Abstract: A year after the first anthrax-tainted letters were dropped into a New Jersey mailbox, the United States is vastly better prepared to face bioterrorism. Yet experts agree that major holes remain in communications, emergency planning and staffing, and many fear America's resolve could fade along with memories of last year's attacks.

There have been no arrests and there are officially no suspects in the criminal investigation into the attacks-by-mail, which killed five and sickened 18. But while the probe appears stalled, efforts to prepare for the next attack have moved steadily forward.

"Public health has always been the poor stepchild. It's never received the dollars, it's never received the attention," said Health and Human Services Secretary Tommy Thompson. "One of the good consequences of 9-11 is we now have the resources available to build the public health system."

Still, much work remains.

An expanded National Pharmaceutical Stockpile is loaded with medicines, vaccines and supplies, ready to land a cargo plane with 50 tons of material in any city within hours. But many communities have no plan for transporting the goods from the tarmac to the patients.

States have new money to hire public health workers, but there's a dearth of talent for hire.

And while cities are now focusing on the threat, experts worry there is still no efficient way to get medical information to the doctors on the front lines.

The anthrax attacks were limited in scale, yet the public health system was severely taxed under the weight of investigating hundreds of false alarms, testing more than 120,000 environmental samples and distributing antibiotics to thousands of people who may have been exposed to the bacteria.

"Last fall was a tragic dry run," said Dr. Michael Osterholm of the University of Minnesota, who advises HHS on bioterrorism. "That was horrible but we all know what it could have been had the same amount of anthrax been put into air intake systems."

The long-neglected public health infrastructure -- the people and systems who guard the community's health -- won an unprecedented, rapid infusion of dollars, nearly dlrs 1 billion. "I can't remember a time when money went out that quickly," Osterholm said.

Yet he and other experts are concerned states will fail to put up their own money to finish the job or, worse, will cut back existing state spending now that the federal dollars have arrived. Some want Washington to ensure that the states spend the money wisely, something the health department has pledged to do (UCLA, 2002).

Title: CDC Head: Agency More Prepared For Bioterror Attack
Date: September 19, 2002
Source: UCLA

Abstract: The US Centers for Disease Control and Prevention (CDC) is better prepared than ever to meet the demands of an attack with a biological weapon, the agency's new chief, Dr. Julie Gerberding, said Thursday.

Speaking to a group of reporters, Gerberding said the agency had been practicing shifting resources in a hurry and improving its communications to the public. She noted that some of the preparation was evident in how the CDC was handling the West Nile virus outbreak this summer.

For instance, the agency has deployed teams around the country to quickly collect blood samples from potential victims and then rapidly send them to a CDC lab in Ft. Collins, Colorado for analysis.

Even so, she noted, "that doesn't mean there aren't gaps." Gerberding said the agency had been working particularly hard on its dealings with the public, noting that during last year's anthrax mailings, the CDC appeared to be disorganized. Top staff had not done a good job of talking about risk either, she said.

"We do need to be prepared to tell people what we know when we know it," said Gerberding, adding that CDC staff should also tell the public that information could change daily.

Gerberding said the agency is confident that it now has the network in place to detect so-called "sentinel" cases of diseases like anthrax that might indicate a wider epidemic is under way. Since September 11, 2001, the agency has been receiving many more calls from physicians and health departments concerned about patients with suspicious fevers and coughs, she said.

These "false alarms" show the system is working, Gerberding stated.

"If there's a first case of smallpox, we're likely to know it, and in very quick order," she asserted.

Gerberding also defended the agency's follow-up of patients who contracted cutaneous and inhaled anthrax last year. In several recent news articles, physicians and patients themselves have claimed the agency seems to be uninterested in their progress--a curiosity, given that much could be learned.

But Gerberding said she has "personally been very concerned about the follow-up," and says the agency has been doing much to ensure it collects data. But, she noted, the CDC can't talk to the patients or get access to their medical records without permission of the state and local health authorities and the patient, as well.

The CDC has been actively monitoring the 10,000 people who received antibiotics due to potential exposure to anthrax, Gerberding pointed out. They were mostly federal postal workers and other government employees, and thus the agency did not need special permission to study them. The CDC study will continue for another 2 years, she said (UCLA, 2002).

Title: Doctors Warn Of Bioterrorism Risks
Date: October 4, 2002
Source: BBC

Abstract: Doctors are warning about the dangers of bioterror attacks.

At a meeting of the World Medical Association in Washington, US, they are warning that health officials need to be on their guard against such an attack - and say terrorists could get hold of biological weapons quite easily.

Professor Donald Henderson, senior advisor on bioterrorism to the US government, told BBC Radio 4's Today programme: "At the top of the list is smallpox, followed by anthrax, by plague, by botulinum toxin that produces paralysis.

"Getting hold of anthrax organisms is not all that difficult because there are such cases occurring amongst animals in many parts of the world every year.

Scientists know who's capable of doing this Dr Vivienne Nathanson, British Medical Association "Getting hold of smallpox would be much more difficult.

"But we know that there are many people who were formerly scientists in the Soviet Union who are now out of work and many of these people left their laboratories, and they can bring with them a great deal of sophistication to a dissident group or a state to produce these."

'Web of Deterrence'
Dr Vivienne Nathanson, Head of Ethics and Science at the British Medical Association, said experts had estimated it could cost just $1m to buy the equipment needed to make weapons grade material.

She called for closer checks on scientific research. "Scientists know who's capable of doing this.

"They should be watching who's got the equipment, who's got the machinery, who's doing something they're not publishing, they're not talking about.

"We need what people call a web of deterrence.

"We need every country to have a law that says anyone working on this is guilty of a serious criminal act and that they are liable, therefore, for very long periods in prison."

She warned a bioterrorism attack could claim more lives than last year's attacks on the United States."

"We know the hijackers on the 11 September were prepared to fly their planes into the towers and die.

"If instead they had infected themselves with something like smallpox and walked around a busy airport or station, the chances are they would have killed millions, not the thousands tragically killed on 11 September."

Detection
Doctors say that dealing with a bioterrorism attack would need the same systems as any other infectious disease - and early detection would be the key to minimising its impact.

Professor Brian Duerden, director of the Public Health Laboratory Service, which covers England and Wales, said like other major countries, the UK could be the target of a bioterrorism attack.

But he said: "What you have to have is systems in place to detect any such attempt at the earliest possible opportunity.

"And that needs the same activities that you have to have in place for any communicable diseases - whether that is the next flu epidemic major food poisoning outbreaks, or the legionella outbreaks we saw a few weeks ago."

He said plans to cope with bioterrorism attacks were in place before last autumn, but these were improved and made more publicly available.

Professor Duerden said he did not see the need for a "web of deterrence".

But he added: "What is important is to ensure that people coming for training in Western countries are of an appropriate background and that you're not risking taking people on who want to use the knowledge that they gain in this sort of way" (BBC, 2002).

Title: A Virus-Fed Doomsday
Date: October 10, 2002
Source: LA Times

Abstract: The debate among the nation's politicians and the advice they're receiving from intelligence experts should not focus exclusively on diplomacy versus preemptive military action against Saddam Hussein. Instead, there is one nightmarish outcome -- the so-called bio-Armageddon scenario -- that is of immediate concern.

It goes like this: We go in to take out Hussein, and his obedient henchmen pull a "doomsday" switch, releasing contagious biological agents for which there is no vaccine and no cure. Not only are hundreds of thousands of American troops wiped out but, if Hussein wishes to die a martyr's death, the virulent agents are released to spread around the world and wipe out half of mankind.

Even mentioning this subject may seem like scaremongering, but it's not. In today's dicey world, this horrific possibility is a biological, military and political fact of life -- or death -- that cannot be dismissed out of hand.

How seriously has the bio-Armageddon scenario been weighed in councils of war? An Oct. 7 letter from CIA Director George Tenet to Sen. Bob Graham (D-Fla.), chairman of the Intelligence Committee, stated that a cornered Hussein might use "his last chance to exact vengeance by taking a large number of victims with him."

It costs about $1 million to kill one person with a nuclear weapon, about $1,000 to kill one person with a chemical weapon and about $1 to kill one person with a biological weapon. Low cost alone may dictate that current and future terrorists will opt for the $1 biological killers.

Last year, a bombshell of a scientific paper, published in the *Journal of Virology*, revealed that a bioengineered form of mousepox -- a close cousin of smallpox -- was vaccine-resistant and 100% lethal. It showed that simply inserting one immune-inhibiting gene into mousepox was all it took.

Is it conceivable that Hussein's well-trained scientists, who crave to please their boss at any cost, have not read this paper and applied its findings to smallpox?

This year, another stunning paper in the research journal *Science* described the complete synthesis of the poliovirus genome in the test tube. This feat of bioengineering pointed out that deadly viruses, such as smallpox, can be resurrected in the test tube. No seed germs are required, as previously thought, just genetic sequences, training in molecular biology at the master's-in-science level and a few years of laboratory work.

It's hard to underestimate or sugarcoat these scientific papers. They offer a blueprint for creating vaccine-resistant and highly lethal viruses that could, for example, render the current smallpox vaccine stockpile and the U.S. government's emergency vaccination program absolutely useless. This biological genie may pose a far greater threat than 1,000 atomic bombs.

It's no longer hypothetical to bioengineer such an agent. And less than $1 million would be required to create deadly and contagious agents.

In the wrong hands, a bioengineered virus could be bottled and used as an insurance policy against invasion and overthrow. And, if unleashed, it could change the very fabric of remaining modern civilization. At a minimum, too many people might be stricken to continue to operate oil refineries, power plants, airlines and communications.

A completely new appraisal and posture are needed to deal with these threats.

First, the U.S. needs to train and place more intelligence agents knowledgeable in this type of warfare throughout the world, because the work taking place in a secret offensive biological weapons program cannot be monitored from airplanes or satellites. It must be spied on firsthand.

Building our biological human intelligence capabilities will take years. It will require the scientific, law enforcement and national security communities to finally work together, which they have shown little inclination to do.

Second, we need to build a high-speed/high-volume infectious disease laboratory and information processing system that links the molecular fingerprints of biological agents to their sources worldwide.

Such a system would provide comprehensive and rapid analyses of biological agents and, when every moment counts, it could help to save countless lives after an attack -- both at home and abroad.

If we had such a laboratory and biological sample collection program working, we could test for the combined signatures of pox viruses and virus-altering proteins. If, for example, the two were found to reside in the wrong hands or places, we could take preemptive actions.

Here's the bottom line: Bio-Armageddon and biological blackmail cannot continue to remain as realistic options for terrorists (LA Times, 2002).

Title: The Biowarriors
Date: October 10, 2002
Source: UCLA

Abstract: Col. Erik Henchal regarded the envelope with a scientist's detachment but a citizen's dread. He had seen this day coming.

The letter, coated in white powder, was meant for U.S. Sen. Tom Daschle. It was now at Fort Detrick in Frederick, home of the U.S. Army Medical Research Institute of Infectious Diseases (known as USAMRIID, pronounced "you-SAM-rid"), carried by FBI escort. Last Oct. 15, as bioterrorism fears had started to sweep the nation, Henchal and John Ezzell, a senior anthrax researcher, knew pretty quickly that something they'd long feared - an attack on civilians with microscopic pathogens - had become reality.

The envelope held the same kinds of spores that would come to kill five people and infect 17 others, either through the skin or, worse yet, after being inhaled. There they would germinate, causing a fever, a cough, nausea and diarrhea. These flu-like symptoms masked a killer. Toxins would course through the body, attacking healthy tissues, vanquishing cells, giving way to respiratory failure and shock if left untreated.

"We knew pretty quickly we were dealing with an authentic threat," says Henchal. "This is the day that we had dreaded. We had been talking for a long time that it's not a question of whether but when."

A year later, the nation's top scientific minds are at work looking for ways to boost biodefense capabilities. But significant questions remain unanswered, questions as persistently complex as the *bacillus anthracis* spores that have long been the scourge of the world's livestock population, lying dormant in soil for years, waiting to be ingested and wiping out entire herds.

Since last October, scientists have learned that an aggressive course of antibiotics, given soon after exposure, works in staving off even inhalation anthrax, a particularly lethal form. They've discovered that new detection tools can yield faster and more accurate results. Anthrax's genetic blueprint has been sequenced, giving law enforcement officers clues to track the origin of strains. And a comprehensive sequencing database should help researchers develop new drugs and diagnostics.

But consider the unknowns. What's the minimum number of spores needed to infect humans? How long can they stay in the lungs before germinating into organisms, unleashing a toxic fury? Do antibiotics offer the best treatment? Are there effective ways to treat patients in later stages of anthrax infection? Can a new vaccine be made that requires fewer shots and has less severe side effects? Is there a way to accelerate the development and regulatory approval of new therapies?

"It's a vast problem ... that involves biology, epidemiology," says Pierre Noel, a physician and U.S. Air Force major who advises the Defense Department and other government agencies on biodefense issues

and is a department head at the National Institutes of Health's Warren Grant Magnuson Clinical Center. "There's some politics involved. The important thing is there's good coordination of the effort."

Henchal says he's seeing "an improving situation every day" - but he also has concerns. Where's the blockbuster collaboration with the pharmaceutical industry and other strategic partners? Will a record level of research-and-development investment generate unrealistic expectations?

"Everybody wants us to have these products now, without due regard to the importance of basic research," he says. "A lot of the products we're transitioning to [advanced development programs] are products we did the basic research on five or 20 years ago. If people want us to have the products of the future, we have to have an appropriate investment in the basic science."

Strict regulatory guidelines mean that new vaccines under development won't be available for years. Cutting-edge, development-stage antibiotics are in short supply. USAMRIID has 14 potential vaccine products stuck in various investigation phases. It can't find takers to license the products because of their small market potential and a lack of clinical testing data. And testing potential vaccines for biowarfare agents in humans is an ethical no-go, since it would mean deliberately infecting a test patient with a deadly virus or bacteria.

"The biggest barriers now are regulatory," says David Franz, a former USAMRIID commander and United Nations biological weapons inspector who now heads the chemical and biological defense division of the Southern Research Institute, based in Frederick.

A whole new approach to biodefense needs to be considered, adds Ken Alibek, vice chairman and chief scientist of Alexandria-based Hadron Advanced Biosystems, which is working with USAMRIID and other Defense Department laboratories to develop drugs to treat late-stage infections and boost immune response.

Alibek is careful to praise the strides made in the last year. But the biowarfare veteran - he was the chief scientist in the former Soviet Union's massive program before defecting to the United States - knows last year's brush with bioterrorism could have been much worse.

"If you spend hundreds of millions of dollars developing new vaccines, you need to answer a very important question: What are you going to do next?" he says. "We need to do a very thorough analysis to develop a national understanding of these threats. We haven't done it yet."

Alibek says resources also are needed to study the immune system's defenses at each stage of infection from a biowarfare agent, finding better antibiotics and beating back the septic shock that shuts down the body's organs in the final stages of infection. But Hardon's products, expensive and time consuming to develop, remain years from clinical testing.

In 1984, followers of an Indian guru named Bhagwan Shree Rajneesh poisoned salad bars at 10 Oregon restaurants with salmonella. With county elections looming, cult members hoped to sicken enough voters so they'd be unable to make it to the polls, enabling their candidates to win. The scheme, a trial run for plans the group had to poison the water supply, sickened about 750 people. Only a year later did public health officials determine the salmonella was man-made and part of a deliberate attack.

"Today that would take 10 minutes [to pinpoint]," says Franz. "If you look at it like that, we've come a long way."

Indeed, new diagnostics offer the most immediate promise for boosting the nation's biodefense. Franz points to work done by Marti Jett, chief of the molecular pathology department at the Walter Reed Army Institute of Research in Silver Spring, as a promising new technology for confirming exposure. Jett's

system samples blood cells for signs they've come into contact with pathogens. Because the symptoms resemble the flu, there's a chance a crucial early diagnosis could be missed.

But cells, when exposed to a pathogen, produce different levels of proteins coded by genes. Scientists call this a change in the gene expression profile, and it could tip doctors that they're seeing something other than flu. Jett's lab has catalogued blood cell responses to other agents like smallpox, anthrax and plague and is collaborating with the Institute of Human Virology in Baltimore to speed the application of the system, which is probably five years away.

Further along are next-generation environmental detection tests like those Gaithersburg-based Igen International is developing with USAMRIID and three other military partners. The tests are built around a process called electrochemiluminescence. Air or soil samples are electrochemically stimulated, and chemical compounds indicative of pathogens are rooted out because the process causes them to emit light. The instruments turn out results in about 30 minutes, according to Richard Massey, Igen's president and chief operating officer.

"The technology is there" for faster, cheaper and more reliable detection, he says. "The government has to figure out what instruments they're going to go with and how they're going to deploy them."

As one of the world's premier biodefense laboratories, USAMRIID is in many ways the fulcrum of much of this next-generation R&D. Since 1969, USAMRIID scientists have gone toe to toe with nature's deadliest viruses, working to unlock their secrets. At headquarters, winding corridors and a series of sophisticated identification scanners lead to suites of laboratories where scientists study anthrax, plague, botulism, tularemia and hemorrhagic fever viruses like Ebola and Marburg. There they develop vaccines, diagnostics and other countermeasures for the military.

USAMRIID's expertise is sought in quelling "hot zones," outbreaks of lethal viruses and bacteria, around the globe. Its research facility is the largest biocontainment lab in the country. To work with the most dangerous agents, like Ebola, scientists must wear a 12-pound "space suit," a pressurized and ventilated rubber suit with a spiral air hose attached to a filtering system.

To do their work - growing cell cultures, infecting them, injecting those into animals - scientists are subject to strict monitoring systems that track their comings and goings as well as their immunization records. An accidental exposure means a stay in a special patient containment ward known as the "slammer."

Henchal, a 22-year Army microbiologist, was named USAMRIID commander in June, and the flood of attention he's received has had little do with his arrival. His 656-person staff has been the focus of federal investigators who believe the perpetrator of last year's anthrax mail attacks may have ties to USAMRIID. The strain used in the attacks was developed there in the 1980s; a former scientist was identified by federal investigators as a "person of interest" but strongly denies any connection.

The pressure has been intense, enough to puncture the morale of a staff already working long hours. From last September through May, USAMRIID scientists, operating with a $50 million research-and-development budget, processed 31,000 specimens and performed 260,000 tests, more than any other government agency.

Its diagnostics staff numbered six last Sept. 10; six weeks later it had jumped to 85. In the past year, USAMRIID has handed 14 biological tests over to the Defense Department's advanced developer, to be used in the field and as part of a national laboratory response network coordinated by the Centers for Disease Control and Prevention in Atlanta.

Henchal believes staff morale at USAMRIID is improving, but scars remain. The FBI continues to scrutinize the lab's security measures and question staffers, Henchal included.

Henchal also says federal agents continue to give USAMRIID "real votes of confidence" and says they're moving closer to ruling out any lab personnel as the perpetrator. He's eager to put the suspicion behind USAMRIID, for its profile to once again be centered on being a leading center of biodefense research.

"I'd like to think we're past that and can now get back to business."

Robert Koch, a German physician, first confirmed the bacterial origin of anthrax in 1876, a discovery that would become a building block for the study of microbiology. As the world's economies transitioned from an agricultural to an industrial base an aerosol version of the bacteria emerged.

A vaccine was approved in the United States three decades ago for soldiers and "high-risk populations," such as animal product handlers. Troops fighting in the 1991 Persian Gulf War were vaccinated after evidence emerged showing Iraq had weaponized anthrax. The vaccine came under controversy after Desert Storm soldiers complained of lingering illnesses they attributed to the regimen of shots, which in some cases cause flu-like symptoms like nausea and fatigue.

One of USAMRIID's top anthrax hunters is Dr. Arthur Friedlander, a physician and infectious disease specialist. The Army veteran, now retired from the military, continues to work at USAMRIID developing a new anthrax vaccine.

The next-generation vaccine updates the original vaccine approved by the FDA in 1971. The new version uses a highly purified, genetically engineered protein technology called recombinant PA, which prevents the proteins in anthrax's lethal toxins from binding to cells and opening them up to infection. The hope is that the new vaccine can be administered with fewer shots - the current cycle requires six shots over 18 months - and with less severe side effects. The vaccine also shows promise boosting antibody strength. Special white blood cells that can ingest the spores will hopefully be coaxed out and sent to do battle. The new vaccine is still at least six months away from clinical tests, when Friedlander and colleagues will begin matching animal testing data showing its effectiveness with safety tests in humans.

"That's the best we can do right now," Friedlander says. "It's a very bizarre set of circumstances in which we're developing vaccines against a potential threat of someone using it, not the very existence of the disease."

Anthrax is only one of many challenges faced by government and industry scientists developing new drugs to combat bioterrorism and arm the nation's public health infrastructure should another attack occur. The threat of a smallpox outbreak tops the list.

Congress' Office of Technology Assessment estimates that the release of 100 kilograms of aerosolized anthrax over Washington, D.C., could kill anywhere from 130,000 to 3 million people; smaller quantities of weaponized smallpox would unleash a pandemic. The smallpox virus spreads among people through close contact - anthrax is not passed between people - causing a rash, high fever and fatigue. It kills up to a third of those infected.

Smallpox disease was eradicated in 1980, but samples of the virus remain. Some are kept in the CDC's maximum containment lab. It was also weaponized in the Soviet biowarfare program, and U.S. officials widely believe it's now in the hands of so-called rogue nations and possibly terrorist groups.

Federal officials are confident the nation's stockpile of smallpox vaccine could handle an outbreak. The government signed contracts with biotech company Acambis and pharmaceutical giant Baxter to produce new doses.

Studies conducted by the National Institute of Allergy and Infectious Diseases show that existing stockpiles of the vaccine could be diluted to provide 300 million doses, enough to inoculate every American.

New vaccines are needed not just for physically fit soldiers but for a civilian population that, with the scourge of the HIV virus, is more immunodeficient than when smallpox was eradicated. And there is still no treatment, beyond vaccines, for smallpox and other potential biowarfare agents.

One bright spot: USAMRIID scientists and colleagues at the University of California at San Diego have been able to stop the replication of the smallpox virus in laboratory cultures with a derivative of an antiviral medicine called cidofovir, used to treat AIDS complications. The drug has also shown promise in early tests on mice.

Five years ago, the Defense Department picked Frederick-based DynPort Vaccine to oversee the development, licensing and manufacture of new biodefense vaccines. With the 10-year, $322 million contract, DynPort today has six vaccines in its pipeline - for smallpox, anthrax, botulinum toxin, plague, Venezuelan equine encephalitis and tularemia. DynPort senior vice president and chief scientific officer Michael Langford says its smallpox vaccine is furthest along and should be ready for licensing in 2005.

He predicts that limited supplies of new vaccines - called investigational new drugs, or INDs - will be stockpiled for use over the next year. But the "conservative nature of the licensing process," due to regulatory guidelines governing drugs, will undercut opportunities to accelerate commercial development and will counter the impact of any pioneering discovery technologies that might emerge, many believe.

"The process of ensuring safety is time consuming," says Langford, a former USAMRIID virologist.

A recent survey by the Pharmaceutical Research and Manufacturers of America found that 256 drugs and vaccines targeting infectious diseases were in development. But, while companies like Eli Lilly and Aventis have given vaccine reserves to the government and started testing drugs for possible biodefense applications, blockbuster collaboration has yet to emerge.

In a nod to developers, the FDA passed a rule permitting them to work around efficacy restrictions. They'll be able to test potential biodefense drugs in animals for effectiveness, while demonstrating safety in humans.

Last Sept. 11, Dr. Anthony Fauci was in a taxi riding through the Queens Midtown Tunnel on his way to a morning meeting in Manhattan when a hijacked jet hit the first World Trade Center Tower. Fauci, director of the National Institute of Allergy and Infectious Diseases, watched events unfold on television until early evening.

Fauci walked 20 blocks down Broadway to Pennsylvania Station to catch an Amtrak home. As the train emerged across the river in New Jersey, Fauci turned for one last look at the New York skyline. Just then, Tower 7, a smaller building next to the two World Trade Center skyscrapers, crumbled to the ground. Fauci had trouble catching his breath as a dust cloud shrouded the skyline.

"I said, 'Uh oh, my world's going to change,'" Fauci remembers. "Because if that's happening with terrorism, bioterrorism's not far behind."

The federal government is set to channel $1.75 billion for biodefense R&D through NIAID, part of the National Institutes of Health. The bulk of that funding, $592 million, is slated for drug, vaccine and diagnostics development. More than $521 million will go to construction of new containment facilities like the one at Fort Detrick. And some of that money will go to institutions like The Institute for Genomic Research in Rockville for basic research.

After last fall's mail attacks, TIGR microbiologist Tim Read and scientists from Northern Arizona University compared the DNA of two anthrax strains - one the kind used to kill a Florida photo editor (case 5) - and found differences that might function as "genetic fingerprints," markers that could help law enforcement agencies pinpoint the origin of pathogens used in future attacks.

Read is leading a team now sequencing 14 other anthrax strains. The sequencing information will be compiled in a database that he believes will aid medicine as much as law enforcement. Armed with better bioinformatics tools, the research will yield new insights into the evolution and pathogenesis of anthrax, Read says, bolstering efforts to design new countermeasures.

Scientists like USAMRIID's Friedlander are already mining the data for clues in the sequence of chemical building blocks in anthrax's DNA that will lead to better diagnosis and treatment, much the way drug companies are using the human genome sequencing to find proteins involved with spurring or blocking disease.

Fauci's under pressure from the White House to deliver a return on investment, to make headway not only in basic research but to come up with "deliverables," applied research leading to the rapid development of new products.

"We need to cover a large waterfront," he says. "It's a challenge, but it's an exciting challenge" (UCLA, 2002).

Title: Another Attack: It Can Happen Here
Date: December 29, 2002
Source: SF Gate

Abstract: The unthinkable has become the inevitable.

Each night in the coming year, Americans will go snug to our beds as eerie White House warnings reverberate in our heads: The United States should brace for a second-wave terrorist attack likely to be even more spectacular than the first. They say it's not a question of if, but when.

But many experts say our preparations for that attack are woefully weak and inadequate. No one from President Bush on down discounts the risk, however.

"We are entering a time of especially grave danger," reads a new Council on Foreign Relations report, published in the fall, from a task force that includes former secretaries of state, former chairmen of the Joint Chiefs, a former director of the CIA and FBI and three Nobel laureates.

Noting that America is planning to attack a ruthless adversary who may well have access to weapons of mass destruction, the report concludes we remain "dangerously unprepared to prevent and respond to" the likely terrorism in our immediate future.

"After a year without a new attack and with our leaders dithering over bureaucracy and funding, the lack of a sense of urgency is appalling," said former Sen. Gary Hart, co-chair of the task force and the U.S. Commission on National Security, which issued similar, largely ignored warnings before Sept. 11.

The frustration is echoed by participants in a science and technology panel assembled by the National Academies: Virtually all of the 134 emergency recommendations they made half a year ago for reducing our vulnerability are still on the shelf.

Panel co-chair Lewis Branscomb, professor emeritus at Harvard and former chief scientist at IBM, calls the coming Iraq venture "an expensive and dangerous diversion" from the real mission of defending against a next attack.

In another terrorist attack, Americans can count on first-responders -- firefighters, medics and police -- to demonstrate the professionalism and raw courage witnessed Sept. 11. But they will be forced to do so without many of the tools they need.

Less than half of public health departments have e-mail, for example. More than 70 percent of cities across the country still cannot afford to buy enough hazardous materials suits to protect the rescue workers who would arrive first following a chemical attack. And thus far, none of the $3.5 billion Congress authorized to local governments for first-responders has even been delivered.

"People running our cities are very, very aware that more needs to be done, " said Karen Anderson, outgoing president of the National League of Cities and mayor of Minnetonka, Minn. "I'd say, please follow through with the funds so desperately needed by our first-responders."

If another major attack exposes lax preparedness, many Americans will question delays that may have seemed justifiable inside the Beltway but were inexcusable elsewhere. Why should it take at least five years for the Homeland Security Department to become fully operational? Why has the smallpox vaccination program been mired in wrangling over legal liability? Wasn't it foolish for the Defense Department to purge some Arabic-language translators because they are gay?

In case of another attack, some political analysts predict, the American public once again will fail to blame President Bush, because they understand the impossibility of absolute security. Instead, they credit him with making progress in security matters, especially as long as another attack does not occur.

Others say the public will be less forgiving the second time around. "Nobody has accused this president of working too hard. If he's got time to go out on the campaign trail for all those Republican candidates for Congress, he's got time to deal with (civil defense)," scolded former Sen. Hart. "Franklin Delano Roosevelt fought a Depression and World War II at the same time."

No clairvoyant can predict precisely how the country would weather a second attack. But analysts are prepared to make educated guesses as a way of assessing our readiness.

The most optimistic scenarios are isolated and manageable -- say, a cyber- attack that plays havoc with air traffic control but is ultimately thwarted by a backup defense system, triggers no plane crashes and barely alters an economy that's looking up in 2003.

There are also worst-case scenarios. **For example: "suicide terrorists" infected with deadly smallpox circulate through Disneyland, the Mall of America and other bustling icons, triggering an uncontainable epidemic on a yet-to-be-vaccinated population, forcing mass closures of schools and businesses and sending the economy into free-fall.**

Last year, a government simulation indicated 15,000 people would contract smallpox, and 1,000 would die, within two weeks of the first patients showing signs of illness. Although the risky smallpox vaccine is effective up to five days after exposure, panicked Americans could swamp the public health system, and there wouldn't be enough licensed vaccine to go around.

When TEC International asked more than 1,000 CEOs this month about their greatest concern for the economic future, few cited higher taxes, energy prices, war or labor shortages. What 40 percent feared most was another terrorist attack here.

The financial ripples of terrorism spread in unexpected patterns, as Sept. 11 underscored. When the U.S.-Canadian border shut down briefly after the attack, many of the "Big Three" automakers' assembly plants went idle within two days, stopping production of $1 million worth of cars at each plant every single hour.

Imagine in 2003 an explosion at the ports of either Long Beach or Los Angeles, which together take in almost half of the maritime containers arriving in the country, not to mention nearly a quarter of California's imported crude oil. The resulting shutdown of West Coast ports would cost at least $1 billion a day and strand much of the state without refined fuels.

"The most likely place for the next attack isn't on an airline, it's rail or a seaport or infrastructure. The shock to the system will be huge, and the country will insist on entirely revamping security at a huge cost," said David Kotok, president of Cumberland Advisors Inc., and a survivor of the World Trade Center attack.

On the other hand, the economy may bounce back from another attack better this time because more fiscal and monetary stimuli are in the pipeline, and because the Federal Reserve reassured the markets by responding calmly and efficiently to Sept. 11.

Public health labs, however, could crash under surging demand for tests in the event of a biological attack. For example, seven months after the anthrax mailings, there was a backlog of thousands of unexamined specimens suspected of contamination.

Many state and local public health agencies face budget cuts. The inadvertent result, according to Dr. Georges Benjamin, head of the American Public Health Association: 2003 will be a year of fiscal emergency for public health.

A second attack likely would precipitate a further crackdown on civil liberties.

"Privately, that's a huge concern for us," said Samuel Walker, author of a book on the history of the American Civil Liberties Union. "Another attack will undoubtedly be used to justify more government snooping, including on innocent people. I think we've learned from our history not to inter Arab Americans as we did Japanese Americans in World War II. It'll be something different -- maybe drastic immigration controls."

How would the American psyche weather another attack?

Psychologists say, in one sense, it will be more painful because Americans still haven't fully healed from the trauma of Sept. 11 -- a skinned knee bumped again is more likely to bleed.

"But one of the most fascinating things about human nature is our amazing adaptability," said Jana Martin, incoming president of the California Psychological Association. "We learn to live with the situations we're in, whether it's people in war-torn countries, or in families with rampant abuse, or in an area like California where a major earthquake could hit at any moment. "

If the experts are right about more terrorism in America's future, resilience will be a prized commodity (SF Gate, 2002).