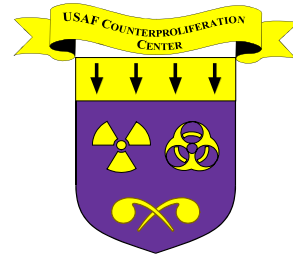


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9 July 2003

USAF COUNTERPROLIFERATION CENTER

# CPC OUTREACH JOURNAL



*Air University*

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PC Magazine, July 2003

[www.pcmag.com](http://www.pcmag.com)

Future Tech: 20 Hot Technologies to Watch

July 1, 2003

## **Health Care: Biosensors**

By Alexandra Robbins

### **Medicine on a chip.**

Years from now, a typical doctor visit might not include dull magazines, pharmacy lines, and saying "Ahh." Instead, a chip implanted in the body will function as a constant on-board doctor, detecting diseases early and delivering drugs straight into the bloodstream. Sound like an Orwellian/Asimov hybrid to be seen in an episode of a Jetsonic future space-age cartoon? Think again. Biosensors could make this scenario a reality before your toddler goes to college.

Biosensors are already thriving in the medical field. External biosensors are used in emergency rooms as point-of-care diagnostic units—such as i-Stat's "lab on a chip," which can reveal almost immediately whether a patient is in cardiac arrest by testing blood chemistry.

Other companies are developing implantable biosensors that track blood glucose levels and deliver insulin.

MicroChips is testing a chip implant that offers long-term, time-controlled drug delivery. Digital Angel has discussed merging its external biosensors with the VeriChip, an implantable microprocessor.

If this decade's hurtling pace of biosensor advance continues, MicroChips president John Santini expects the technology to be used as in-the-flesh physicians within ten years. "It's a very exciting time," he says. "Our next step is a manually, wirelessly controlled biosensor that detects and treats an acute condition, and then a biosensor that will approximate an artificial organ; it'll sense a condition and respond automatically without user intervention." Given the current zeitgeist, the market thrust has shifted to biosensors' security capabilities amid the hot topic of biowarfare. A recent report from market research firm In-Stat revealed that the media spotlight on this application may be premature: Despite the public's anticipation that biosensors with real-time detection will be able to monitor biological and chemical weapons, the technology hasn't caught up with expectations. Presently, biosensors in environmental monitoring stations nationwide can detect compounds like anthrax—but detection can take 12 to 24 hours. The best ones on the market take 20 minutes.

Sandia National Laboratories is developing the MicroChemLab, a system that detects biotoxins in 5 minutes. It should be deployed in the Boston subway within the next year, says microfluidics technical manager Art Pontau. His team is currently trying to upgrade the MicroChemLab to integrate both gas-based and liquid-based analysis into one handheld device.

This type of biosensor could be incorporated into military uniforms and eventually into houses as the biowarfare equivalent of a smoke detector, says Marlene Bourne, a senior analyst with In-Stat. At the current rate of technological progress, this real-time application could be ready within five years, though the social issues involved could lengthen the process. "It's a great application in theory, but if there's a false positive, panic could ensue—and a false negative could be a huge liability," says Bourne.

Meanwhile, experts disagree on how the focus on terrorism will affect biosensor development. Bourne says there's a concern that nonbiowarfare applications could get lost in the shuffle. One of the most important applications is in industry, where biosensors monitor air quality and emissions at chemical refineries and quality control at food-processing plants. Currently, testers take random samples off the food line and use biosensors to detect E. coli and salmonella. If funding isn't diverted to military applications, within five to ten years biosensors could be used in food lines to test every product.

Although national security presently drives the market, Pontau expects the MicroChemLab's ultimate goal to be a lab on a chip that immediately detects illnesses from cancer to the common cold. Indeed, some experts are banking on the defense industry to advance biosensor progress across the board. "If the defense arena can accelerate the program," says MicroChips' Santini, "I'm confident we'll have the biosensor artificial-organ system soon."

<http://www.pcmag.com/article2/0,4149,1137664,00.asp>

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Washington Post

July 8, 2003

Pg. 1

## **White House Backs Off Claim on Iraqi Buy**

By Walter Pincus, Washington Post Staff Writer

The Bush administration acknowledged for the first time yesterday that President Bush should not have claimed in his State of the Union address in January that Iraq had sought to buy uranium in Africa to reconstitute its nuclear weapons program.

The statement was prompted by publication of a British parliamentary commission report that raised serious questions about the reliability of British intelligence that was cited by Bush as part of his effort to convince Congress and the American people that Iraqi President Saddam Hussein's weapons of mass destruction program were a threat to U.S. security.

The British panel said it was unclear why the British government asserted as a "bald claim" that there was intelligence that Iraq had sought to buy significant amounts of uranium in Africa. It noted that the CIA had already debunked this intelligence, and questioned why an official British government intelligence dossier published four months before Bush's speech included the claim as part of an effort to make the case for going to war against Iraq.

The findings by the House of Commons Foreign Affairs Committee undercut one of the Bush administration's main defenses for including the allegation in the president's speech -- namely that despite the CIA's questions about the claim, British intelligence was still asserting that Iraq had indeed sought to buy uranium in Africa.

Asked about the British report, the administration released a statement that, after weeks of questioning about the president's uranium-purchase claim, effectively conceded that intelligence underlying the president's statement was wrong.

"Knowing all that we know now, the reference to Iraq's attempt to acquire uranium from Africa should not have been included in the State of the Union speech," a senior Bush administration official said last night in a statement authorized by the White House.

The administration's statement capped months of turmoil over the uranium episode during which senior officials have been forced to defend the president's remarks in the face of growing reports that they were based on faulty intelligence.

As part of his case against Iraq, Bush said in his State of the Union speech last Jan. 28 that "the British government has learned that Saddam Hussein recently sought significant quantities of uranium from Africa."

The International Atomic Energy Agency told the U.N. Security Council in March that the uranium story -- which centered on documents alleging Iraqi efforts to buy the material from Niger -- was based on forged documents.

Although the administration did not dispute the IAEA's conclusion, it launched the war against Iraq later that month. It subsequently emerged that the CIA the previous year had dispatched a respected former senior diplomat, Joseph C. Wilson, to Niger to investigate the claim and that Wilson had reported back that officials in Niger denied the story. The administration never made Wilson's mission public and questions have been raised over the past month over how the CIA characterized his conclusion in its classified intelligence reports inside the administration.

The report by the House of Commons Foreign Affairs Committee followed weeks of hearings by the panel into two intelligence dossiers on Iraq's weapons programs -- one published in September and the other in January -- that the government of Prime Minister Tony Blair used to justify supporting the administration in going to war against Iraq. Questions about the British government's handling of intelligence have mirrored many of the issues being raised in the United States. But they have created a far greater political uproar in London.

Parliament's response has been notably different than that of Congress. The House and Senate intelligence panels have moved cautiously, with Democrats and Republicans divided over the necessity of full-blown public hearings into the administration's use of pre-war intelligence. The House of Commons moved quickly to investigate the matter, with the Blair government battling accusations that it misled Parliament and members of the Labor Party in persuading them to support an unpopular war.

The commission's report issued yesterday found that Blair and his other key ministers "did not mislead" Parliament in describing the threat from Iraq's alleged chemical, biological and nuclear weapons programs. But the panel did find that the Blair government mishandled intelligence material on Iraq's weapons of mass destruction programs. The panel said it is too soon to determine whether the government's assertions about Iraq's chemical and biological weapons programs will be borne out, but added that the government's actions "were justified by the information available at the time."

In a major political issue within Britain, the panel found that Alastair Campbell, Blair's communications chief, "did not exert or seek to exert improper influence" in drafting the September intelligence report or a key claim in the document that "the Iraqi military are able to deploy chemical or biological weapons within 45 minutes if ordered to do so."

The panel did find that the 45-minute claim "did not warrant the prominence given to it" in the first pages of the dossier because it was based on "intelligence from a single, uncorroborated source." The panel asked the Blair government to explain why it was given such a prominent position in the report.

A senior administration official said yesterday that a classified version of a U.S. National Intelligence Estimate on Iraq's weapons programs, completed last September, contains references to intelligence reports that Iraq had attempted to buy uranium from three African countries, not just Niger. The other two countries are Namibia and Gabon, according to intelligence sources. The sources said the reports about other countries have not been confirmed and that some government analysts do not consider the information reliable.

A senior intelligence official said that there were reports of "possible attempts" by Iraqis or their agents to buy uranium, but that "they were all somewhat sketchy."

One Bush administration official said British and U.S. intelligence agencies got their Niger documents from the intelligence service of one country that he refused to name, but that others have identified as Italy.

"We both had one source reporting through some liaison service which said, 'Look what we found,' " this official said. "There were other [intelligence] reporting streams, but it may be that all streams are traced to the same source."

<http://www.washingtonpost.com/wp-dyn/articles/A23777-2003Jul7.html>

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USA Today  
July 8, 2003  
Pg. 8D

## **New Pox Drugs**

By Steve Sternberg, USA Today

U.S. Army researchers confirmed Monday that early laboratory tests of several innovative drugs appear to kill several poxviruses, including monkeypox and cowpox, without harming normal cells.

ViroPharma's research is still in its infancy, with human tests two years away. But the results so far look promising, said Marc Collett, vice president of ViroPharma, the Exeter, Pa., firm that winnowed the potential drugs from its bank of 450,000 chemical compounds.

"We're pretty excited because we have something that's quite potent, very selective, doesn't kill cells and (could possibly be taken orally)," he said.

Over the next several weeks, researchers from the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) will test the effectiveness of the new drugs against the most lethal member of the pox family, smallpox, in the maximum containment laboratories at the Centers for Disease Control and Prevention in Atlanta. USAMRIID officials involved in the testing could not be reached for comment, but spokesman Chuck Dasey confirmed the accuracy of ViroPharma's account.

If the tests are successful, the experimental compounds offer the first glimmer of hope that it might be possible to develop a drug against one of mankind's deadliest diseases and further reduce the nation's susceptibility to a bioterrorist attack.

Researchers historically have had a tough time developing antiviral drugs, and smallpox has proved as difficult to combat as all the other viruses. Instead, most public health experts chose to focus on using smallpox vaccine to eradicate the disease, rather than pushing for drugs to treat a virus soon to become extinct. The threat of bioterrorism changed the equation, as did Project Bioshield, President Bush's proposal that the government buy and stockpile any drugs and vaccines capable of countering bioterror agents.

Although the federal government has stockpiled enough smallpox vaccine for the entire population, the risks of the live-virus vaccine have impeded government efforts to immunize health workers and first responders, many of whom have been unwilling to roll up their sleeves.

Researchers next plan to test the drugs' efficacy against several poxviruses in animals, beginning with cowpox-infected mice and monkeys with monkeypox. Eventually, USAMRIID researchers hope to test the drugs' effectiveness against smallpox in monkeys. Over the next couple of years, Collett said, the firm hopes to identify the best drug candidate and begin initial testing in humans.

[http://www.usatoday.com/news/health/2003-07-07-pox-usat\\_x.htm](http://www.usatoday.com/news/health/2003-07-07-pox-usat_x.htm)

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New York Times  
July 8, 2003

## **Iran Confirms Test Of Missile That Is Able To Hit Israel**

By Nazila Fathi

TEHRAN, July 7 — Iran has successfully conducted the final test of a midrange missile, a spokesman for the Foreign Ministry here confirmed today.

The missile, called Shahab-3, was first tested in 1998 and has a range of 806 to 930 miles, which means it can reach Israel and American troops stationed in Saudi Arabia and Iraq.

The spokesman, Hamidreza Assefi, was responding to a report in the Israeli newspaper Haaretz last week, which said the test had been carried out just over a week before.

"Apparently, the Israelis are late in getting the information," Mr. Assefi said at the Iranian Foreign Ministry's weekly news briefing. "The test took place several weeks ago, and it was a final test before delivering the missile to the armed forces. It was within the same range that we had declared before."

Iran contends that the missile relies entirely on Iranian expertise, but it is widely believed that the Shahab, or shooting star in Persian, employs North Korean technology. The United States Department of State imposed

penalties on a North Korean company and five Chinese companies last week, saying they sold missile technology to Iran.

"We are very concerned, especially since we know that Iran is seeking to acquire the nuclear weapon," an Israeli government spokesman, Avi Pazner, said immediately after the Iranian confirmation, according to a report from Agence France-Presse.

"The combination of Shahab-3 and the nuclear weapon would be a very serious threat on the stability of the region," he added, according to the report.

The United States said today that it had "very serious concerns" about Iran's missile programs and that it viewed them as a threat to the region and to American interests. But American officials said that the latest test flight was one of several in recent years and that it was not a particular surprise.

"We have long had very serious concerns about Iranian missile programs," said Richard A. Boucher, the State Department spokesman. He said the United States had noted Iran's efforts to develop its missile abilities for nearly two decades.

He said that the missile program was "a threat to the region and a threat to U.S. interests in the region" but that it would be addressed with diplomatic, political and economic pressure with "like-minded countries" along with other Iranian activities, including its nuclear weapons program.

Last month, the International Atomic Energy Agency declared that Iran had secretly processed nuclear material. Iran has denied those accusations, insisting that its nuclear research is meant only for peaceful purposes like energy.

Foreign Minister Jack Straw of Britain, during a visit to Iran last month, said the European Union would cut trade ties with Tehran if it refused to open its sites to inspections.

Dr. Mohamed ElBaradei, the director of the International Atomic Energy Agency, is scheduled to visit Iran on Wednesday. He is expected to urge the Iranians to sign a protocol that would allow the agency's inspectors to make surprise visits to nuclear sites and to take samples.

<http://www.nytimes.com/2003/07/07/international/middleeast/07CND-IRAN.html>

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London Times

July 9, 2003

## **Weapons Specialists Who Can Help Blair**

By Stephen Farrell, Elaine Monaghan and Michael Evans

THE bland name gives nothing away, like the unit itself, but the Iraq Survey Group, and its 1,200 experts on weapons of mass destruction, are what Tony Blair is depending on to find Iraq's elusive arsenal and save his credibility.

The group is a specialist unit, made up of American, British and Australian military and other civilian agency personnel.

It was appointed in late May in what the Pentagon called a "significant expansion" of the so-far fruitless hunt for Saddam Hussein's weapons of mass destruction.

Its headquarters is located on the outskirts of Baghdad, near the vast, high-security military area that is Baghdad International Airport, but unlike the United Nations' prewar weapons inspection teams it hardly advertises its presence.

As one military official put it, the group is "not terribly forthcoming" about its work.

Back in London, government sources insisted yesterday that the group was steadily amassing evidence proving the existence of programmes to develop weapons of mass destruction.

They said that the investigators had already uncovered a substantial amount of documents, equipment and suspect material, and they expressed confidence that the Government's September dossier would be "substantiated in the main".

But they also said that the investigation would continue for several more months and were wary of making any public claims until they could present a detailed picture.

American defence officials were also optimistic. "It's going to be a complex, long task, but in the end the truth will out," one said. "We remain confident that the evidence will be compelling."

Republican senators who returned from a visit to Iraq last week promised imminent revelations, although their Democrat counterparts were less sanguine. Pat Roberts, of Kansas, said: "My judgment is that there is going to be breaking, positive news on that front in the very near-term."

But for now, such statements must be taken on trust, because the group is giving little away. Its only known breakthrough came when an Iraqi scientist admitted that he had been told to bury components of a nuclear bomb in his garden 12 years ago. Mahdi Obeidi dutifully handed over to US officials parts for a centrifuge system for enriching uranium.

The unit is headed by Major-General Keith Dayton, director of operations for the US Defence Intelligence Agency. He has a British deputy, Brigadier John Deverell.

The unit has offices in Baghdad, Washington and Qatar, where 120 analysts and 250 processors advise and monitor the work going on inside Iraq. About a hundred of the group's members are British.

Unlike its predecessor, the much smaller 75th Exploitation Task Force, the group has not set out to scour all 900 "suspect sites" spread across Iraq and identified before the war. Instead, equipped with mobile laboratories, its staff study the reams of data recovered from Iraqi officials, institutions and intelligence sources. They then dispatch mobile site survey teams to particular locations.

One military source in Baghdad said: "The way the XTF operated was that if someone tripped over a site they would come along and do an analysis. The ISG is much more intelligence-led.

"There is a lot of analysis and document searches that produce leads, which other units then go out and check.

"Rather than wade through the haystack trying to find the needle, they devote their effort to trying to find people who can tell you where the needle is."

Guards or lorry drivers who witnessed comings and goings at suspect sites might be more helpful than higher-level figures "who may not want to tell us anything", General Dayton said.

As members of the survey group descend on a village where possible witnesses live, they will be accompanied by specially trained interrogators, military and civilian, to extract information from the Iraqis.

"Things could have been either taken or buried, they could have been transported, or they could have been destroyed," General Dayton said. "That's the assumption I'm going in on."

The group's headquarters has joint interrogation, debriefing and material exploitation centres, chemical and biological intelligence support teams and an operations centre. Military sources revealed that it has "virtual reality" capabilities that allow it to draw upon the nuclear, chemical and biological weapons expertise of British and American institutions including Porton Down, the biochemicals research centre near Salisbury.

The unit reports directly to US Central Command based in Florida and is operating independently from Paul Bremer's Coalition Provisional Authority.

<http://www.timesonline.co.uk/newspaper/0,,172-739590,00.html>

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International Herald Tribune

July 9, 2003

## **Iranian Exiles Describe Newly Found Nuclear Site**

By Brian Knowlton

WASHINGTON - A new Iranian nuclear complex, apparently with close links to the military, has been found northwest of Tehran, according to an Iranian opposition group that has provided reliable information in the past on such facilities.

The information, if confirmed, would further bolster the Bush administration's contention that Iran is violating its commitment under the Nuclear Nonproliferation Treaty not to produce nuclear weapons. The site, known as the Kohladouz complex, apparently is under much more clear-cut military control than sites revealed earlier by the opposition group and confirmed by the International Atomic Energy Agency, the United Nations monitoring organization. Those sites were under the control of the Atomic Energy Organization of Iran. If the military link is confirmed, it would strengthen the suggestion that the work done at the complex is linked to a weapons program. The information was presented at a news conference by Alireza Jafarzadeh, a spokesman for the National Council of Resistance of Iran. The council includes several Iranian organizations that seek the ouster of the government in Tehran.

"Iran, more vigorously than ever, is continuing its efforts to acquire nuclear weapons," Jafarzadeh asserted.

The presentation came a day before Mohamed ElBaradei, director general of the IAEA, was to arrive in Tehran - with the backing of the United States, Britain and several other countries - in an attempt to secure an agreement to give his inspectors greater access to Iranian nuclear facilities.

It also came a day after the Iranian Foreign Ministry confirmed a successful final test of a missile, the Shahab-3, with a range sufficient to reach Israel, as well as parts of Saudi Arabia and Iraq where U.S. troops are stationed.

As with the earlier revelations, Jafarzadeh said that the latest information had come from the Mujahedeen Khalq, a rebel group also known as the People's Mujahedeen that is a member of his council. The United States classifies that group as a terrorist organization, although Jafarzadeh's organization maintains that the designation was a politically motivated U.S. gesture aimed at building ties to what had been seen as an emerging moderate wing of the Iranian leadership.

Iran has insisted that its nuclear programs are designed to produce energy for civilian use.

Jafarzadeh would provide no further details on the source of his report, but he offered a detailed picture of what his group says the Kolehdoz complex represents. He said it was hidden among warehouses and workshops for building tanks and armored personnel carriers, in part of a broader complex overseen by the Defense Industry Organization. Attempts to contact IAEA spokesmen for comment on Jafarzadeh's report were not immediately successful.

[http://www.iht.com/ihtsearch.php?id=102194&owner=\(IHT\)&date=20030709132508](http://www.iht.com/ihtsearch.php?id=102194&owner=(IHT)&date=20030709132508)

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Washington Times

July 9, 2003

Pg. 21

## **Biological Terrors And Potentials**

*The invisible menace of bioterrorism*

By Martin Schram

The most deadly and menacing attack using a weapon of mass destruction will not begin with a mushroom cloud overhead, horrific, yet instantly identifiable, as a nuclear strike. Nor will it begin with a panic in a subway below city streets, with people choking on a chemical that is unseen, yet unmistakably poisonous peril.

The most deadly and menacing attack will begin with nothing visible or detectable to indicate there has even been an attack. And for days, it will spread through a population — unnoticed, undetected, undiagnosed, even when it first appears as an apparently isolated case of a rare illness. Then, there will be a second, maybe nearby, maybe not, — a sickness that may or may not be recognized as similar; and then, there will be several others, still seemingly unconnected occurrences.

Crucial days will pass before authorities eventually detect that the nation has been attacked — massively and expertly — by biological weapons of mass destruction, wielded by terrorists who are now nowhere to be found. By then, the nation will be struggling to limit the spread of death. Struggling against time and nature to quarantine a germ that has had a perilous head-start., struggling to find and distribute the proper vaccine and medicines. Experts may discover that the nation has been attacked by a new, genetically engineered, weaponized germ. Perhaps, a weaponized germ for which there is no known cure.

This is, of course, is a worst-case scenario. For 100 years after H. G. Wells' 1899 classic "War of the Worlds," this was the stuff of frightening fiction. Ever since September 11, we have known that we are living in a world that is at war with itself. We must do all we can to assure that today's worst case scenario does not become tomorrow's news. In researching a recent book and television documentary series ("Avoiding Armageddon: Our Future. Our Choice"), I was determined to present more than a handwringing investigation of the threats we face and spotlight bold solutions. There were indeed bold responses to nuclear terror — safeguard America's national security by securing Russia's under-secured nuclear arsenals and materials before terrorists get them. So, too, with the vast chemical arsenals in Russia and elsewhere.

But, for the threat of bioterrorism, solutions proved more limited than most experts like to say. International treaties do not outlaw the possession of pathogens, which are vital for research and vaccines; they outlaw possession of pathogens for the wrong purposes — for making war, not medicine.

"With modern biotechnology, it's no longer necessary for there to be large stocks of these materials," according to Alan Zelicoff, a syndromic surveillance expert at the Sandia National Laboratory in Albuquerque, N.M. "Rather, they can be brewed up in a matter of days to weeks, in sort of a just-in-time philosophy. So, there's nothing to detect except intent, and intent is a very, very hard thing to measure."

So, it is that most of our programs are understandably focused on what can be done post-attack. Valuable efforts are underway to improve our ability to recognize and treat attacks using germs as weapons — anthrax, smallpox, and so on. There are new computer coordination efforts linking the Centers for Disease Control and Prevention with hospitals throughout the nation to greatly reduce the time it takes to detect that we have been attacked. (The swift detection of the recent non-terrorism outbreak of monkeypox — and the link to prairie dogs kept as pets — was

impressive.) There are efforts to make vaccines available. New sensors can now detect biological and chemical perils in subways, public buildings and city streets.

Most recently, scientists at the Institute for Genomic Research in Rockville announced that they had cracked the genetic code for the anthrax bacterium, a major step in future treatment efforts. But the science that produces a new generation of cures and preventatives can also be used by those with hateful motives to produce a new generation of weapons that cannot be defended — germs that cannot be defeated. Genetic engineering could someday be used to combine the properties of the world's most communicable germs (such as smallpox) and the most deadly germs (such as Ebola virus).

The result: The world may be on the verge of seeing a new weapon unleashed, one that can be easily launched by anyone suicidal enough to want to wreak havoc without concern for their own well-being. And one that cannot be feasibly defeated with the technology we have today.

The best news out of all of this may be the fact that the same properties that make weaponized germs so perilous also make it exceedingly difficult for terrorists to use — without contaminating themselves or their own people. Bioterror cannot be used in a region where enemies live side-by-side, such as the Middle East, for example, because germs targeted at an enemy are sure to spread and infect a perpetrator's own people.

But in today's new, real world, we know that terrorists are willing to kill themselves by flying jet planes into buildings to kill thousands of innocent people they never met. So, it is not unreasonable to expect that terrorists might also willingly infect themselves just to spread death by germs through a population that is an ocean away from their own homeland. Which is why bioterror may be the most menacing threat we face today.

*Martin Schram, a columnist with Scripps Howard News Service, is the author of "Avoiding Armageddon," a new book about weapons of mass destruction and terrorism.*

<http://www.washtimes.com/op-ed/20030708-085024-6914r.htm>

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Washington Times

July 9, 2003

Pg. 20

## Smallpox And Bioterrorism

*There are real risks and grave consequences*

By Dr. William Bicknell and Kenneth Bloem

The Iraq war is over, no WMD have yet been found and the administration's smallpox plan appears to be running out of steam. Instead of being well on the way to vaccinating up to 10 million civilian health, emergency and public safety workers as called for by President Bush, we are stalled at 37,608. Our message to the nation's health authorities: This is not the time to go wobbly on biodefense.

Bioterrorism is a real risk. Smallpox is easy to hide in any freezer and, whether or not WMD are found in Iraq, it is only one of a number of states on the list of suspects. Of all biological weapons, smallpox has the greatest potential for widespread harm. But the risk of death or serious harm to anyone from any form of terrorism is very low.

Therefore, we should live our daily lives normally, not in fear, while government takes steps to reduce chances of terrorism, when it occurs, to minimize consequences. Have we done this with smallpox? Not yet. There is vaccine for everyone, but we are ill-prepared to rapidly contain smallpox after a bioterrorist release. Monkeypox is a timely reminder that the unexpected can happen and take time to recognize.

As we conclude in a forthcoming Cato Institute briefing paper, the president's December 2002 vaccination plan is sound. The military is on track, with more than 450,000 vaccinated, no deaths, no lasting side effects and no harm to any immunocompromised persons. We do not believe that our government is vaccinating the military just to make a political statement. What's wrong on the civilian side?

Although CDC guidelines have recently improved, they continue to overstate the risk of vaccine side effects, and erroneously suggest that, after an attack, the techniques used decades ago to eradicate smallpox will work well today.

Here are the facts:

\*Vaccinating healthy adults is low risk, about 1 death per 15 million. If you don't worry about driving to work or crossing a busy street, don't worry about getting vaccinated.

\*Smallpox is infectious before there is a visible rash. Anyone infected by a terrorist will be infecting others before they know they have smallpox.



\*If a person is vaccinated up to several days after being infected, disease is not prevented, nor is transmission to others. Illness is likely to be less severe and the risk of death reduced.

\*There is little residual immunity in the U.S. population, and, for persons born after 1972, when routine vaccination stopped, no immunity.

\*We cannot rely on the techniques used to eradicate smallpox 30 years ago, when immunity was high, people were less mobile and there was no malicious dissemination.

We must protect against the unlikely, but very serious, consequence of several highly motivated, well-trained terrorists traveling to different cities and infecting 50 to 150 people in each city. Terrorists may be ill, but not so ill that they cannot walk in crowds, cough on us in crowded places and travel to another city. In this scenario, hundreds of Americans would be infected before anyone knows we have been attacked. Rapid control would demand rapid local mass vaccination, and, almost certainly, nationwide vaccination.

The CDC director said the true measure of the president's plan is whether the entire nation could be vaccinated within 10 days of an attack. We are not close. An attack today would be contained in two or three months, not a few weeks. There would be many preventable deaths, vast avoidable economic loss and, potentially, massive societal disruption. Spread to other countries, where control would be even more difficult, would be excessive.

Homeland Security and the White House should revitalize the National Smallpox Vaccination Program and meet with leaders of medical, hospital, and nursing associations, as well as relevant unions, stressing: This is a national security issue; the risk to healthy adults is minimal; there is a good approach in place for liability and compensation; and the nation needs their help. Protecting hospitals, minimizing societal disruption and rapidly vaccinating the rest of us post-attack requires that up to 10 million acute medical care, selected public health, emergency and public safety workers be voluntarily vaccinated pre-attack.

As more people are vaccinated pre-attack, fewer are at risk post-attack. There are fewer to vaccinate and infection of others is more difficult. Therefore, give citizens a choice and promote the voluntary vaccination of all healthy adults. Citizens should be in the driver's seat, not only for smallpox, but also for anthrax. N95 masks will be helpful in preventing infection with anthrax and smallpox. A seven-day supply of Cipro per person, to be used only if an anthrax release takes place, will shorten by days the distribution of Cipro from government stockpiles. Add potassium iodide to reduce one effect of a dirty bomb, and at modest cost we will have maximized protection against three terrorist threats.

Whether smallpox, anthrax or radiation, control is easier if we have a good national plan. Putting protection in the home strengthens all plans, and in the case of a bad plan or flawed implementation, far fewer people will needlessly die or become ill.

*Dr. William Bicknell is a former commissioner of Public Health in Massachusetts and a professor of International Health at Boston University's School of Public Health. Kenneth Bloem is former CEO of Stanford University Hospital and Georgetown University Medical Center. He participated in the smallpox eradication program in the Congo and Bangladesh.*

<http://www.washtimes.com/op-ed/20030708-085022-6715r.htm>

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Washington Times

July 9, 2003

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## **Battling Infectious Diseases**

By Tara O'Toole and Thomas Inglesby

An enlightened approach to the problem of bioterrorism could, within a generation, eliminate bioweapons as agents of mass lethality. Thus far, the government has taken a number of useful incremental steps intended to improve the country's ability to withstand a bioterrorist attack, but the Bush administration and Congress are treating bioterrorism as though it is a public health problem with national security implications — not as a strategic threat to the nation. This is a mistake.

A single terrorist attack on America, no matter how catastrophic or tragic, is not likely to threaten the continuation of fundamental social institutions or democratic processes — unless the attackers wield a nuclear or biological weapon. Only these weapon classes have the capacity to inflict casualties on a scale that could threaten the viability of a city's or a region's key institutions. A covert bioterrorist attack would likely also impose a widespread sense of vulnerability, as officials tried to determine who else was at risk from the original attack, and people across the country worried that more attacks were on the way.

In the fall of 2001, 22 cases of anthrax shut down delivery of the U.S. mail to Congress for six weeks and landed 10,000 people on antibiotics. Outbreaks of contagious disease, which can be spread from person to person are especially disruptive. A few dozen SARS patients in a major teaching hospital in Toronto forced the closure of the Intensive Care Unit, the Cardiac ICU and the SARS assessment unit, and diversion of ambulances to other hospitals. The Far Eastern Economic Review estimated that, as of April 2003, Asian economies had suffered losses of \$10.6 billion as a result of SARS.

Bioweapons are attractive to would-be terrorists, in part because the materials needed to make them are openly available, and usually indistinguishable from equipment intended for legitimate purposes. The basic expertise required to build a potent bioweapon is possessed by many tens of thousands of individuals throughout the world, and the procedures associated with growing large quantities of pathogens are practiced routinely for many beneficent and profitable purposes and openly available. As we have seen in the wake of the 2001, anthrax attacks, assigning responsibility for a bioterrorist attack is extremely difficult — a feature that both enhances terrorists' attraction to these weapons and diminishes traditional deterrence through retribution.

The effectiveness of 20th-century bioweapons — those bacteria and viruses that are on the Centers for Disease Control and Prevention list of Class A Agents — have been known for decades. What the world will soon have to contend with is the dark side of the stupendous advances now occurring in bioscience.

We are in the early stages of a revolution in the life sciences that is revealing and allowing us to manipulate the "parts list" and "biocircuits" of living organisms. These new powers to play Lego with living organisms will produce prodigious benefits in medicine and agriculture. But this same knowledge will also, inexorably, allow the creation of new and more dangerous pathogens, new ways of "weaponizing" such pathogens and novel means of inflicting them on civilian populations.

There is no way to decouple beneficent and malignant applications of this knowledge: Understanding the mechanisms of disease can be used to cure the dreaded illness or to worsen the affliction. Furthermore, as with any advancing field, progress will make the key technologies needed to carry out such manipulations simpler and more available.

What should the country be doing about the threat of bioterrorism?

\*For starters, bioweapons and nuclear weapons should be distinguished from all the other countless ways a thinking enemy could attack American civilians. Countering bioterrorist attacks should be a top-level goal of U.S. national security strategy, on par with avoiding nuclear war or preventing new countries or terrorist groups from acquiring nuclear weapons.

\*Second, the United States should leverage its extraordinary bioscientific talent and resources against the bioweapons threat. We need to enlist the country's best research scientists, clinicians and public health professionals from universities and the private sector in the creation of a major research and development program, the aim of which should be to eliminate epidemics of infectious disease in our lifetime.

The core of such a program should be a research and development effort that aims, in the near term, to produce diagnostic technologies, drug therapies and vaccines against the 20th century bioweapons threats — anthrax, smallpox, etc. Commendably, following the attacks of 2001, the administration moved rapidly to establish a large reserve of smallpox vaccine. But there is a need to fundamentally change the way we currently pursue biomedical research and product development. We must find ways to dramatically reduce the time from the discovery of a new pathogen to the production of effective therapy. It now takes about 8 to 10 years to develop and license a new drug or vaccine. If we are to contend successfully with the bioterrorist threat in the age of modern biology, we must shrink the time from "bug to drug" to weeks.

The biodefense research and development effort, being run by the National Institutes of Health, is a step in the right direction, but the scale is much too modest, and there is no long term plan — not even an articulated commitment on the part of the government to affirm that such research is considered vital to national security and part of a larger defense strategy. Unless political and scientific leaders affirm the importance of biodefense, top scientists are not likely to abandon their current projects for biodefense research and development, nor are young scientists likely to enter the field. Ways must be found to link the expertise that resides in the private sector biotech and pharmaceutical communities to the nation's need to produce effective bioweapons countermeasures cheaply and quickly.

NIH is the world's greatest institution of biomedical research, but it is not in the business of producing drugs and vaccines, and many doubt that the traditional NIH peer review process can deliver useful countermeasures anytime soon, if at all. Whether the administration's Bioshield initiative will entice private sector investors into biodefense research and development remains to be seen, but most observers judge it highly unlikely that such modest tweaking of market forces will produce a robust biodefense program.

\*Third, therapies and vaccines are, of course, useless unless we have medical and public health systems that are capable of delivering medicines to where they are needed and caring for sick people — possibly very large numbers of very sick people needing care suddenly and for extended periods.

One way or another, we will have to build the medical systems necessary to cope with sudden mass casualty situations and the public health systems needed to provide the situational awareness essential to managing epidemics, whether they be natural or deliberate. Designing and implementing such systems will not be easy, fast or cheap.

\*The cost of not having them in place, should they be needed, could be catastrophic loss of life, economic instability and permanent damage to democratic processes.

Funding for biodefense must be commensurate with the seriousness of the threat and the magnitude of action needed. In the wake of the terrorist attacks of 2001, the Bush Administration requested, and Congress appropriated, over a billion dollars to improve the ability of state health departments to respond to possible bioterrorist attacks — a tsunami of money in public health, an area of civic investment that has been neglected for generations. Yet, according to the American Public Health Association, this infusion of cash has not even offset the loss of resources most state health departments are experiencing as a result of state budget downturns. In this fiscal year, only \$535 million is being sought to improve mass casualty preparedness among the country's 5,000 hospitals. The \$1.72 billion appropriated for research and development related to biodefense and emerging infectious diseases is the largest single increase in NIH history. But compare these figures to the \$6.8 billion being spent on missile defense research and development in fiscal year 2003 alone.

This proposed biodefense strategy is a radical departure from current thinking about national defense priorities. The political and economic costs of a serious biodefense research and development effort, of significantly improving medical and public health bioterrorism response capabilities, are large.

The political, economic and human costs of not building these programs, of not improving vital systems until after a major bioterrorist attack, will be larger. If America were to take on this challenge, if we decide to amass our scientific talent against the mysteries of infectious disease, and we figure out how to build health systems that actually work, on a large scale and in crisis, we could, within a generation, rid the planet of the ancient scourge of infectious disease epidemics.

*Drs. Tara O'Toole and Thomas Inglesby are director and deputy director, respectively, of the Johns Hopkins University Center for Civilian Biodefense Strategies.*

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Washington Times

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## **The Power Of Biomedical Research**

By Anthony S. Fauci

The anthrax attacks in the fall of 2001, which occurred soon after the catastrophic terrorist assaults on the World Trade Center and the Pentagon on September 11, have starkly exposed the vulnerability of the United States — and, indeed, the rest of the world — to bioterrorism.

In response, the U.S. government has committed an extraordinary sum (nearly \$6.0 billion in fiscal year 2003) to develop strategies and countermeasures to protect Americans from further attacks by bioterrorists. This funding has enabled a multifaceted and comprehensive approach to civilian biodefense, involving the Department of Homeland Security and agencies of the Department of Health and Human Services, including the Center for Disease Control, the Food and Drug Administration and the National Institutes of Health (NIH).

The resources appropriated to the NIH alone for the conduct of biomedical research leading to the development of countermeasures against agents of bioterror were more than \$1.5 billion in fiscal year 2003.

With this infusion of resources to the research enterprise come enormous responsibilities, which are taken very seriously. At NIH, we have rapidly accelerated research devoted to the prevention, diagnosis and treatment of diseases caused by potential agents of bioterrorism. While our efforts have focused on the "Category A" agents considered to be the most likely and potentially devastating bioterror threats (smallpox, anthrax, botulinum toxin, plague, tularemia and hemorrhagic fever viruses such as ebola), research is also being conducted on a much longer list of potential bioterror agents that pose significant threats to human health, as well as on chemical and radiological threats.

NIH has long sought to translate basic research findings into real-world interventions, but the path to product development has not been central to our research strategy. The terrible terrorist events in the fall of 2001 compelled us to change our approach. We remain committed to conducting the basic research that has served and will continue to serve as the underpinning of applied research — and that approach has long been the strong suit of NIH, through its own scientists, grantees and contractors. However, given our vulnerability to terrorism in the post-September 11 world, we now have taken a proactive leadership role in facilitating the transition from basic to translational research and product development, and now think in terms of time frames that are uncharacteristically brief for biomedical research. In essence, we have developed an expanded paradigm, one in which we strike a balance between the time-honored goals of pursuing basic scientific research as the true foundation of all our objectives, and the need for leadership in the pursuit of applied research to develop rapidly biodefense countermeasures.

In order to develop rapidly such countermeasures, we must engage our partners in industry in creative ways, and significantly bolster our interactions with the private sector, including both smaller biotechnology companies and large pharmaceutical corporations. Many of the products that need to be developed to protect our citizens do not of themselves provide sufficient incentives for industry to become involved. The federal government will likely be the only major customer for biodefense countermeasures, and hence the potential profit margin for these products is tenuous. Furthermore, there is no guarantee that such products would ever be utilized; many might simply be stockpiled with the hope they would never be used. Therefore, it is critical for the federal government to push more aggressively the margins of basic research into the realm of pre-clinical and pre-advanced development of countermeasures, and to seek nontraditional collaborations with industry and provide them with assurances that, if they join forces with the federal government in good faith and provide the advanced development of relevant countermeasures, their products will be purchased.

This concept was articulated by President Bush in his announcement of Project BioShield in his State of the Union address on Jan. 28 of this year, and is now being considered for authorizing legislation by Congress. The BioShield bill is designed to speed the development and availability of medical countermeasures in response to the threats that our nation faces. The goals of Project BioShield are: 1) to expedite government research on countermeasures; 2) to create incentives for private companies by providing secure sources of funding to develop countermeasures for inclusion in the stockpile; and, 3) to give the government the authority to make these products widely available quickly, in a public health emergency prior to classic licensure. The importance of this legislation to the nation's homeland security strategy cannot be overstated.

As we consider an expanded paradigm for biodefense research, it is important to remember that the fruits of these efforts will provide benefits far beyond protection from deliberate acts of bioterrorism. Nature herself is the worst bioterrorist, as we have seen with the emergence of HIV/AIDS and, more recently, West Nile virus, SARS and monkeypox infections in the Western Hemisphere. The research facilities, activities and intellectual capital directed to the study of bioterror agents, together with the rejuvenation of our public health infrastructure, will undoubtedly help in the fight against other emerging and re-emerging diseases as well.

The reality of bioterrorism is one we cannot ignore. Together, with our academic and industrial partners, the federal government is aggressively pursuing the rapid development of medical countermeasures against bioterrorism. If we do the job as it can and should be done, the biodefense response we are mounting will have many positive implications for the defense of our nation and for health in general, for decades to come.

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Jerusalem Post  
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## **Is nuclear ambiguity an anachronism?**

**By Erik Schechter**

Israel is believed to be the sixth largest nuclear power in the world, and everyone in the country knows about its reactor in Dimona. So why is talking about it a taboo?

Every society has its taboos. The Yanomamo people of Brazil do not dare utter the names of their deceased. Likewise, the Apaches in North America, avoid owls as incarnations of the dead.

In Israel, one does not mention the country's nuclear weapons program in Dimona. Everyone knows it exists, but no one speaks its name without adding the magic formula "according to foreign sources": breaking the taboo can mean a jail cell. This deliberate governmental policy is called "nuclear ambiguity."

But in 1986, former Dimona technician Mordechai Vanunu sold to the London Sunday Times photographs of plutonium spheres used for triggers in Israeli nuclear warheads. The Mossad quickly caught up with the shutterbug in Rome. Vanunu is currently finishing up an 18-year sentence for treason, espionage, and selling state secrets in an Ashkelon prison.

Today, typing in the keywords "Israel" and "nuclear weapons" draws no fewer than 269,000 hits on the internet. One can even find satellite photographs of the Dimona nuclear complex on the Web. Yet while India and Pakistan took the plunge in 1998 and declared themselves nuclear powers, Israel still clings to the policy of nuclear ambiguity out of fear of being slapped with economic sanctions.

The policy is hopelessly outdated. In fact, the strategic considerations that first led Israel to secretly develop a nuclear program in the 1950s no longer hold. As the region's leader in conventional military power, Israel may best serve its security needs by pushing for a Middle East free of all weapons of mass destruction (WMDs).

Israel is believed to be the sixth largest nuclear power in the world. According to Joe Cirincione, director of the Nonproliferation Project at the DC-based Carnegie Endowment for International Peace, Israel has enough nuclear material to fashion 100-180 bombs.

Others have put that estimate as high as 400 bombs. "That's the point of ambiguity - to keep everyone guessing," says Cirincione.

Cirincione says that Israel's nonconventional forces are arranged in a triad: nuclear warheads can be delivered by air, land, and sea. The idea behind the redundancy in forces is, as the old cliché goes, not to keep all your eggs in one basket. So if for some reason its 200 F-16 fighter jets cannot reach their target, Israel could always let loose with a 500-kilometer range Jericho missile or Jericho II, which can fly three times that distance.

Finally, in 1999, Israel bought and received three Dolphin-class diesel submarines from Germany. With a travelling range of 4,500 kilometers, these vessels have the ability to launch cruise missiles, and it is suspected that they are armed with nuclear-tipped Popeyes.

But rather than counterbalancing Arab weapons of mass destruction, he says, Israel's nuclear program ironically provided "the strongest stimuli for the Arabs to build their own bio-chemical weapons programs."

ACCORDING TO Avner Cohen's *Israel and the Bomb*, published in the United States, Israel's nuclear program goes back to 1955, the year of the first international conference on atomic energy. Israeli scientists, such as Weizmann Institute physicist Amos De Shalit, thought they could exploit president Dwight D. Eisenhower's "Atoms for Peace" program as cover for a reactor that would really build nuclear bombs.

Shimon Peres, who was director-general of the Defense Ministry at the time, had other plans. The father of Israel's nuclear program, Peres turned to the French, who had secretly allied themselves with Israel during the 1956 Sinai Campaign.

Peres was on good terms with prime minister Guy Mollet, and his successor Maurice Bourges-Maunoury, and he won their country's agreement to help Israel build the Dimona reactor in 1958.

Peres writes in his book *Battling for Peace* that the project was built over the objections of the Finance Ministry and the Foreign Ministry. Dimona's construction cost Israel \$80 million, half of which was raised by private donors abroad.

By 1959, the new, pro-Arab de Gaulle government backed out of the reactor deal and Israel continued on its own. A year later, American intelligence caught wind of the project, and the Eisenhower Administration demanded an explanation. Israel claimed that Dimona was designed for peaceful uses only and that any plutonium byproduct - useful for making bombs - would be returned to France. It never was.

President Kennedy was particularly tenacious on the nuclear non-proliferation front. In April 1963 he took then-deputy defense minister Peres off guard and bluntly asked him about Israel's nuclear effort, to which Peres replied, "I can tell you most clearly that we will not introduce nuclear weapons to the region, and certainly we will not be the first."

That would become the shibboleth of Israel's nuclear ambiguity policy. The Americans eventually came to realize that by "introduction" Israeli diplomats meant conducting a nuclear explosive test. By the late 1960s, Israel had already produced a nuclear bomb, so it seemed unlikely it would give it up by signing the 1968 Nuclear Non-proliferation Treaty.

A year later, the Nixon Administration dropped the idea of American inspections in Dimona, and Israel would go on to deny the existence of a nuclear arsenal.

The United States was more than willing to play along, says Larry Korb, director of national security studies for the Council on Foreign Relations, in New York. A former assistant secretary of defense in the Reagan administration,

Korb says that "there would have been negative domestic political consequences if it looked like we were pressuring an ally surrounded by enemies to give up weapons needed for its defense."

It was also not guaranteed that Israel would yield to American pressure on such a sensitive topic. "If we tried to force Israel to give up its nuclear weapons, and it said no, we would lose credibility," he notes. (see box on India-Pakistan.)

MUCH HAS changed in the Middle East since Israel first decided to travel down the nuclear road. Israel is no longer a friendless, impoverished country surrounded by enemies backed by a hostile superpower.

Egypt signed a peace treaty with the Jewish state in 1979 and Jordan followed suit in 1994. Iraq has likewise been neutralized as a threat after coalition forces toppled the regime of Saddam Hussein this past April. As for the Soviet Union, the Arab states' erstwhile patron fragmented in 1991 into 15 successor states - all of which currently have diplomatic ties with Israel.

By contrast, the United States - which only began selling arms to Israel in 1962 - provides the Jewish state with more than \$3 billion in annual aid. The Americans have some 250,000 troops stationed in the region, including prepositioned munitions depots in Israel.

It has long been suspected that the IDF has been galloping ahead of its remaining opponents, but now there is hard proof. In May, Tel Aviv University's Jaffee Center for Strategic Studies came out with a new study that argues that - thanks to advantages in precision-guided munitions, intelligence-gathering, and communications - the Israel Air Force could quite comfortably best a coalition of Arab countries.

"Against Syria alone, it's a joke," says Col. (Res.) Shmuel Gordon, who authored the study. "Israel has a four-to-one advantage in military air power."

What makes Gordon's work so radical is his methodology. Instead of just blindly comparing platforms, such as a MiG-21 fighter jet versus an F-16, the study examines the quality of the weapons systems they carry.

He can also track the rise and fall over time of a nation's "index of power" vis-a-vis its rivals. His conclusion: Over the past 10 years, the military has been spending too much money and often on the wrong things.

An ex-employee at the Dimona reactor estimated its operational cost at \$500 million. "Building nuclear weapons is immoral and a waste of money," says Gordon.

They surely do not help fighting the type of low-intensity conflicts that the IDF has been waging with the Palestinians, but what about countering biological and chemical weapons?

The fear of the "poor man's atomic bomb" is inflated, say nuclear nonproliferation experts. "Nuclear weapons are far, far more deadly than other weapons of mass destruction," says Daryl Kimball, director of the DC-based Arms Control Association.

"Bio-chemical weapons may kill hundreds," says Cirincione, "but they aren't the Plague." As a tool for terrorism they are effective, but not so in mechanized warfare. It is not by accident that they were used in the Iran-Iraq war, which saw infantry attacking in human waves.

Something also has changed since Dimona first went into operation: The core is now some 40 years old. This is a safety hazard, says Uzi Even, who worked for 20 years as a physicist in the reactor and was the first openly gay Knesset member.

Dimona was a success, says Even. Aside from its intended purpose, the 1960s-era reactor served as a school for the young nation's machinists and metal workers. But he now worries about its continued safety.

"In every other country, they close down a reactor that old," says Even. "Radiation damage leads to a deterioration of the core."

Gerald Steinberg, a senior research associate at Bar-Ilan University's Begin-Sadat (BESA) Center for Strategic Studies, says that Dimona is under the strict supervision of the Israel Atomic Energy Commission and "a special strategic subcommittee of the Foreign Affairs and Defense Committee of the Knesset."

But Even insists that Dimona is military-industrial fiefdom above the law.

"The environment minister cannot enter the place," says Even. "I find it hard to believe that, over the past 40 years, there have been no reported accidents occurring there."

But more importantly - and here the physicist carefully chooses his words - "We have already gotten all that we needed from the reactor."

Closing down the plant would not change that fact. Again, without saying what is produced at the reactor, he simply notes that "plutonium has a half-life of 24,000 years."

Many are doubtful that the international community would be satisfied with such a move. There would still have to be an accounting and destruction of suspected nuclear weapons held by Israel. "Closing down Dimona would be a positive first step," says Kimball, "but it won't solve the basic problem of WMDs."

INDIA AND Pakistan offer an example of another alternative strategy for Israel: openly declaring its stock and weathering only temporary sanctions. Louis Rene Beres, a hawkish political scientist at Purdue University, argues that coming out of the closet would actually help Israel's nuclear deterrence capability.

According to Beres, it is not enough that enemy states know that Israel has WMDs. They only deter if the enemy believes they could realistically be used. The Libyans, Iranians, and Syrians "need to recognize that these Israeli weapons are sufficiently invulnerable to attack and/or that these weapons are targeted at their own pertinent weapons and command-control systems."

However, Steinberg notes that Israel, unlike Pakistan and India, is not racing against a rival nuclear opponent in proving its military capability. So long as no enemy is on the nuclear threshold, there is no incentive to go public. Preoccupied with building its own bunker-busting tactical nuclear weapons, the Bush Administration will not challenge Israel's nuclear ambiguity, adds Korb.

"Ending this policy would create new tensions with Washington that are unnecessary and potentially very costly for Israel," says Steinberg.

The most novel idea is for Israel to offer to give up its nuclear stock in return for regional peace and a ban on WMDs in the Middle East. In 1996, Peres floated the idea when he said, "Give me peace and we'll give up the atom."

Should Israel forcefully press the issue now, countries like Iran, Egypt, Libya, and Syria will find themselves under the uncomfortable scrutiny of the Bush Administration - especially after its tour de force against Saddam Hussein's Iraq. Furthermore, at the end of the day, Israel would still keep its conventional military advantage.

True, Ukraine, Belarus, and Kazakhstan voluntarily gave up their nuclear weapons and later regretted doing so, but they only inherited their arsenals from the former USSR. They lacked the technology and knowledge to build them themselves. A de-weaponized Israel would find itself in a similar situation to that of Japan - ready to build weapons if the need arose. (See box)

Steinberg is not persuaded. "Knowledge is one thing, getting the materials and facilities is quite another," he says. Charles Glaser, a nuclear strategy expert at the University of Chicago, says that even if Israel could opt for a virtual nuclear stock - that is, having all the basic components of a bomb, it may be preferable for regional peace to keep its current arsenal.

"The problem with virtual nuclear stocks is when you need them, you have to race against the other side to put them together first. That creates a very unstable situation."

### **India and Pakistan join in**

Once upon a time, there were three states that pursued nuclear ambiguity as a strategy. However, in 1998, two of them - India and Pakistan - openly tested their nuclear weapons, incurring short-lived economic sanctions from the United States.

It was not as if the two countries took the world by surprise. The United States and other Western nations knew of India and Pakistan's nuclear capabilities for decades. India, in particular, did an even poorer job than Israel of disguising its nuclear weapons program.

In 1974, Indira Ghandi's government detonated the country's first atomic bomb, which was explained away as a "peaceful nuclear explosive" intended for heavy-duty construction projects. The Pakistanis did not fall for that line and proceeded with their own nuclear program.

"India made a huge strategic mistake in openly becoming a nuclear power," says Gerald Steinberg, a senior research associate at Bar-Ilan University's Begin-Sadat (BESA) Center for Strategic Studies, "essentially allowing Pakistan to follow, and thus, reaching strategic parity."

Kamal Mitra Chenoy, an associate professor of international studies at Jawaharlal Nehru University, agrees that India threw away a three-to-one advantage over Pakistan in conventional arms, but New Delhi had little choice.

"They were trying to deter China which detonated its own bomb in 1964," he says.

India had two enemies on its borders. Just two years before, the Chinese People's Liberation Army occupied the disputed region of Aksai Chin and still lays claim to an Indian federal state. In 1971, China backed Pakistan in its war with India.

But tensions simmered down somewhat between India and Pakistan. Both countries professed the shared goal of arms control, though they avoided signing the Non-Proliferation Treaty and went on to test both short-range and intermediate-range missiles.

"But unlike Israel, they did not fit their nuclear devices on missiles and planes," says Daryl Kymball, director of the Arms Control Center in Washington.

They kept virtual arsenals, so the US was willing to turn a blind eye. In fact, for five years until 1990, the White House fought off a Congressional attempt to apply limited sanctions on Pakistan.

That all changed in March 1998.

Atal Behari Vajpayee of the right-wing Bharatiya Janata Party (BJP) became prime minister of India. The BJP had long supported developing nuclear weapons, but now the majority of the Indian public had come around to this position. Cheney states that besides strategic considerations, the failure of the recognized nuclear powers to disarm - as is their obligation under the NPT - ensured the popularity of the initiative.

Responding to India's public rethinking of its nuclear policy, Pakistan tested its intermediate-range Ghauri ballistic missile in April. In mid-May, India openly tested five nuclear bombs, prompting Pakistan to conduct tests of its own.

Israel, the one remaining undeclared nuclear power, had piggybacked off early French nuclear tests and then weaponized by late May 1967. Not so, India and Pakistan. Both countries had to be sure that their virtual stocks could be translated into effective weapons.

"They had to start thinking about the vulnerability," says Charles Glaser, an expert on nuclear strategy at the University of Chicago.

In response, the US slapped Pakistan and India with the Glenn Amendment to the 1961 Foreign Assistance Act, which prohibits assistance to any non-nuclear power that conducts a nuclear explosion.

But soon the Americans were reversing course. And after 9/11, when the United States needed Pakistani assistance against the Taliban, all sanctions were removed from both countries.

The US simply had to deal with the fact that there were two more declared nuclear powers in the world.

### **Japan's virtual nukes**

If it wanted, Japan could build a nuclear weapon within 30 days, says Joe Cirincione, director of the Nonproliferation Project at the DC-based Carnegie Endowment for International Peace. The East Asian country has the money, technology, and - most importantly - the plutonium to pull it off.

"Japan has virtual nukes," says Cirincione.

During World War II, the Japanese army was already hard at work on an atomic bomb at Tokyo's Institute of Physical and Chemical Research. But due to a lack of government funding, the weapons project did not make much progress.

The Americans delivered the coup d'grace in April 1945. Some four months before the destruction of Hiroshima and Nagasaki, a B-29 bomber obliterated the institute's thermal diffusion separation apparatus.

After the occupation and reconstruction, Japan emerged as a de-militarized country relying on the protection of the US armed forces.

On February 5, 1968, Prime Minister Eisaku Sato pledged that his country would not possess, manufacture, or accept nuclear weapons. Three years later, the Japanese parliament affirmed that commitment, and in 1976, the country ratified the Treaty on the Non-Proliferation of Nuclear Weapons.

Japan did not, however, entirely forgo the atom.

Despite its galloping modernization, the country is poor in natural energy resources. The financial aftershocks of the 1973 Arab oil embargo also taught it not to depend too heavily on imported fuel. So it should come as no surprise that Japan's nuclear output nearly doubled between 1985 and 1996.

Still, Japan has been suspected of having all the basic, raw components for a nuclear bomb without actually producing one. Its shift from uranium fuel to stockpiles of plutonium MOX (mixed oxides) particularly worries non-proliferation experts.

"Japan was trying to create a self-perpetuating source of fuel, so it would not have to import uranium," says Daryl Kimball, director of the Arms Control Association in Washington.

Since 1969, Japan began sending its nuclear waste to Europe for reprocessing. There, plutonium was extracted from spent uranium fuel rods to be fed right back into the nuclear energy production loop. But the plutonium MOX powder proved too costly to use in reactors, says Kimball, so the stuff has just been piling up.

And the temptation to turn to weapons manufacturing likewise grows.

Bombmakers prefer plutonium to uranium because it requires less radiation to create a nuclear chain reaction. In other words, one gets more bang for the buck. Indeed, in June 2002, Chief Cabinet Secretary Yasuo Fukuda publicly stated that "depending upon the world situation, circumstances and public opinion could require Japan to possess nuclear weapons."

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