

INVITED ARTICLES

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COVER STORY

The Growing threat of WMD Terrorism

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VIEW POINT

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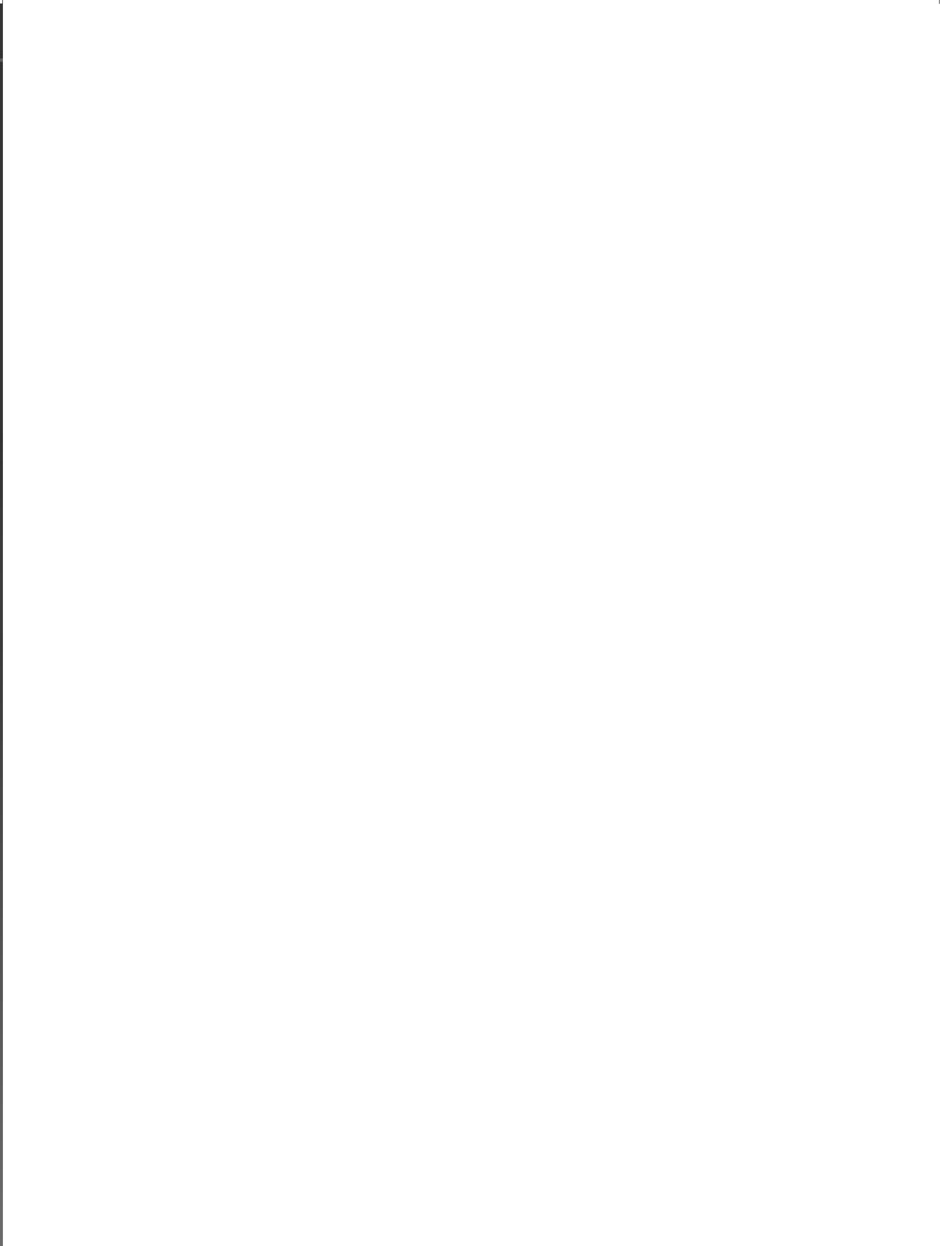
CHEMICAL AND BIOLOGICAL NEWS

BOOK REVIEW

Dr. Priyanka Singh



Institute for Defence Studies and Analyses



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With this issue the CBW Magazine successfully completes the full circle of four issues. We have received encouraging feedback from our readers and we will work towards improving its quality and the content.

On August 18, 2008 a meeting of experts on bio-weapons opened in Geneva. In this backdrop the issue looks at the threat of bio-terrorism and WMD terrorism. The issue also features other regular sections like country profile, chemical and biological news and the book review.

We are thankful to our readers for their continuing interest and support to the CBW Magazine.

Contributions and feedbacks are welcome and can be addressed to: **editorcbw@gmail.com**

Invited Articles

The threat of Bio-terrorism

Amb. Arundhati Ghose

The author was India's Permanent representative/Ambassador to the United Nations.

On August 18, 2008 a meeting of experts on bio-weapons was held in Geneva. On July 29, 2008 a top Al Qaeda operative was reported killed by an attack on the Pakistan-Afghanistan border by a US drone launched missile. July 2008 also saw a series of bomb blasts in Bangalore and Ahmedabad. These three disconnected events could be the predecessor of nightmare scenarios and this should not be treated as just alarmist rhetoric as, it has been agreed that bio-weapons are likely to be used by terrorists than on the battlefield. What India needs is a mechanism which also handles the security aspects of a bio-weapon attack.

On the August 18, 2008, a meeting of experts on bio-weapons was held in Geneva. The meeting considered (i) national regional and international measures to improve bio-safety and bio-security, including laboratory safety and security of pathogens and toxins and (ii) oversight, education, awareness raising and adoption and/or development of codes of conduct with the aim of preventing misuse in the context of advances in bioscience and bio-technology research with the potential of use for purposes prohibited by the Convention (the BTWC). The results of these discussions will be considered by the States Parties in December this year.

On the July 29, 2008, a top Al Qaida operative, was reported killed by an attack on the Pakistan-Afghanistan border by a US drone launched missile. Abu Khabab al-Masri, according to sources quoted by the Washington Post, headed Al Qaida's efforts to produce biological and chemical weapons before fleeing Afghanistan in 2001. Since 1999, he had distributed training manuals that contained instructions for making Chemical Weapons (CW) and Biological Weapons (BW).

July 2008 saw a series of bomb blasts in Bangalore and Ahmedabad. These blasts followed others- all in cities with an international profile-either as centres of India's economic boom or as major tourist destinations. Local explanations have been put forward and at the moment, a shadowy little-known outfit has claimed responsibility. (India, it has been said, has suffered from the largest number of terrorist attacks after Iraq and Afghanistan).

These three seemingly disconnected events, however, could hold in them the portent of nightmare scenarios-and this is not just alarmist rhetoric. It has been agreed that bioweapons are more likely to be used by terrorists than on the battlefield; the terrorists, it would appear are not focusing on mass destruction, but on the threat of creating terror, uncertainty and loss of confidence among the civilian population and images of instability and uncertainty abroad. It is significant that the International Crisis Group has identified India as one of the areas where the situation has deteriorated. In this background, the presence in the country of persons trained perhaps by individuals like al-Masri cannot be ruled out. How prepared is India for a BW attack or the threat of an attack? It is not clear whether any attempts have been made to access the training journals said to have been circulated by al-Masri, whether any attempt has been made to track them, in cooperation with the US. Despite growing bonds

with the US, the sharing of intelligence by the latter would seem to be restricted to the ISI of Pakistan, though going by newspaper reports, this relationship has come under strain in the recent past. There are, of course discussions with the US on the threats of bio-terrorism- but these seem to be restricted to interactions with the Ministry of External Affairs, which can, at best, act only in response to articulated domestic needs. The Home Ministry, already tied in knots in trying to deal with insurgencies and the aftermath of terrorist attacks that have become so routine in our country, is hardly an office that inspires confidence that it could even look at prevention of such attacks, much less WMD attacks. The Ministry of Defence is quite appropriately concerned only with protecting the military from WMD attacks; their mandate does not cover the hapless civilian population. Under the current dispensation, BW and CW threats are 'handled' by the National Disaster Management Authority (NDMA) working under the Ministry of Home Affairs. The NDMA is reported to have prepared standard operating procedures to be followed in the case of a BW attack. However, these responses treat an attack in the same manner as a natural disaster- in other words, the public health aspects of the response. While readily accepting that such SOPs are important and our preparedness could act as a deterrent to a terrorist planning such an attack, it is equally important to not only try to prevent such a situation from arising but to bear in mind that BW are weapons-i.e. there is hostile intent behind its use or threatened use. It is not quite the same as the outbreak of disease or an epidemic, unless these have been deliberately caused by some hostile force. Even in terms of the safety and security of laboratories where these pathogens might be available, a BW attack would imply more than an accidental release or a release due to negligence, where the intent is not hostile though the consequences would be as terrifying. At the moment there is no coordinating body in Government which would examine all aspects of a potential BW attack and take steps to try and prevent such action.

At the same time, other countries have drawn up their programmes to deal with this threat-

multilaterally, such exchange of experiences and best practices could, if there was a coordinating body within Government, perhaps in the National Security Council Secretariat, dealing with WMD terrorism, its implications and prevention, be accessed in the structures set up under the implementation of the BTWC.

It will be recalled that, in 2001, the US, by refusing to accept the painfully negotiated verification protocol to the BTWC, had seemed to have presaged the demise of the Convention. However, the compromise that had been worked out- detailed discussions amongst experts on specific topics followed by meetings at the intergovernmental level, would appear to be a much more useful, if innovative way to promote international cooperation in meeting the challenges of BW terrorism. The onus for the implementation of the Convention has been placed on the States Parties themselves and not on a so-called 'international community' which polices the compliance of the Convention. This approach has not been particularly successful in the nuclear field and has, instead led to an increase of confrontation among States, with dangerous implications. The BTWC model, on the other hand, enables all States to share expertise and experience, on the premise that all responsible States would be interested in preventing bio-terrorism- it is a common fight against groups which do not abide by basic humanitarian laws and cannot be controlled as States can.

India has been participating in these meetings on a regular basis; what is intriguing is the gap between the participation at the international level and the implementation at home. We seem to be more comfortable in exchanging views at the bilateral level than adept at absorbing information or making use of forums at the multilateral level for our benefit. While there may be an overlap in terms of issues being dealt with, there is an obvious need for a coordinating mechanism which also handles the security aspects of a BW attack and guides the activities of the NDMA in the event of such an attack.

The Growing Threat of WMD Terrorism

Dr. Harsh V Pant

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There are numerous difficulties in the way of attempting a universal definition of Terrorism. This is so because there are a number of political and social contexts that shape Terrorism. Thus the question which arises is how there can be a 'global war on terrorism' when we cannot define as to who the 'terrorists' are? However the United Nations has drafted a definition of the term 'terrorist' but it has been impossible to ratify it as certain states do not agree with it. But for the limitations definitions are necessary.

Terrorism is both a subjective and a pejorative term. This being so, difficulties emerge in attempting to find a definition of terrorism that can be classified as universal. The key problem with defining terrorism is that it is ultimately a moral judgement shaped by social and political contexts and so, definitions will vary depending on these contexts. But how can we have a "global" war on terrorism when there will never be unanimity over exactly who the terrorists are? It has of course been argued that those who are labelled terrorists have been driven to act in the way that they do because it is the only means left to them to tackle "injustice." The argument is that they act out of desperation, and while their actions can be perceived by some as reprehensible there will always be others who support them. The United Nations (UN), of course, recognises the right of "self-determination" and the right to resist oppression – hence it recognises freedom fighters.

The UN has a draft definition of the term "terrorist." However, it has not been possible to ratify it because certain states do not agree with it. They want some wording in the definition to the effect that states themselves can be terrorist actors. These are mostly Arab nations who want Israel to be seen as a terrorist actor. The only state that has ever been accused of being a terrorist is the US itself when it was accused by the International Court of Justice of being a terrorist for its actions in mining Managua Harbour in 1987 during the Contra war in Nicaragua.

For all their limitations, however, definitions are crucial. Without a clear labelling of the "enemy" there can be no global cooperation and such cooperation is vital when the threat is from international terrorist networks. In the past, states would have their own domestic terrorism and knew who the "enemy" was and how to deal with them. Nowadays,

with international terrorism, we can't even say what the threat is, never mind deal with it. The world, therefore, looks to the UN. But if the UN can't define terrorism, who can? Under Resolution 1373, after September 11, 2001, the UN has said who some terrorists are. The Taliban, Al-Qaeda and Osama bin Laden are all decreed to be terrorists by the UN. As a consequence, we get the rhetoric identifying just about every terrorist on the planet being a member of Al Qaeda because Al Qaeda is deemed unequivocally to be a terrorist organisation.

Terrorist violence is different from other forms of violence in that it targets edifices (symbols) and non-combatants for the sake of some political and social objective. The violence is so shocking because it is often unexpected in terms of both time and location. It occurs too against a background of peace and thus appears in sharp relief. Terrorists are weak; for the weak to have an effect they have to produce acts out of all proportion to their size and hence the need for the spectacular.

It has been suggested that over the last few years there has been a general move away from terrorism inspired by political demands to one apparently driven by more religious and millenarian motivations. If such a sea-change in motivations has indeed occurred and is allied to the increasing availability of weapons of mass destruction (WMD) then, it is argued, new attitudes and counters are required. Contemporary terrorists seem to be operating to a range of motives from exacting revenge against perceived oppressors, through the fulfilment of an apocalyptic prophecy and millenarian aims, to supremacists ideals.

Political terrorism still exists, however, as exemplified by the Basque separatists in Spain and communists in the Philippines. To a degree, the terrorism practiced by Al Qaeda is also political in that there are demands for the US to change policy and leave Arab lands. The Palestinian problem also continues. This is largely political and not religious in nature though the likes of Hamas and Hezbollah bring a religious element to bear. Al Qaeda as a

movement is only peripherally interested in the Palestinian situation; it is not its *raison d'être*.

The end of the Cold War resulted in a decline in political inspiration and funding for terrorist groups that were being used by the two blocs against each other. States in the post-Cold War environment have become reluctant to openly support political terrorism, resulting in a swift move away from political terrorism in a climate where history seemed to have already ended.

Globalisation and the associated rise in international crime emerged as a concern. This rise in so-called super-terrorism by non-state actors who are financially motivated is a particular worry because of the difficulty in obtaining reliable intelligence on these groups. There are also state-sponsored terrorist groups who have the backing of "rogue" states. These groups might be the most dangerous because they will have capability not usually available to other non-state actors. Military superiority on the conventional battlefield has also pushed adversaries towards unconventional alternatives. The very real threat of a rogue state resorting to asymmetric strategy in order to level the military playing field is difficult to ignore.

The forces of globalisation and the changes they have produced has engendered a backlash from conservative elements, notably extremist global jihadis, who see their religious and cultural principles under threat by these new socio-economic forces. The children of many who made good in the growing wealth of the Arab states, especially Saudi Arabia, have rejected the opulence and worldliness of their fathers. They have sought solace in religion and struck out against those that seem to threaten their religion. They have the financial clout to finance terror and the ability to do so because their education has given many of them the ability to blend in to western societies and not arouse suspicion. Alienation from societies (both immigrants and domestic) of younger generations mixed with a growing anger at many of the socio-cultural forces make them susceptible to radicalisation. Greater activity by jihadi extremists borne of the successful

revolution in Iran and by mujahideen and later Taliban's successes in Afghanistan also influenced this process.

As for millenarian terrorism, there isn't really any more than before, but some groups may gain access to WMD and the scientists who know how to weaponise them, making them more of threat now than they used to be before.

Brian Jenkins famously suggested in the 1970s that terrorists want a lot of people watching and a lot of people listening and not a lot of people dead. This does not seem to hold much water in the present context. In fact, terrorist may still want a lot of people watching; they may simply think that they need a lot of people dead in order to get world's attention. The trend seems to be moving away from attacking specific targets and towards more indiscriminate killing. It has been noted that since the 1970s terrorists have been becoming more lethal even though there was a perceptible decline in terrorist violence in the 1980s.

It is in this context that the combination of this new terrorism and the WMD proliferation assumes an altogether new dimension. Traditional terrorist groups will probably not show much interest in WMD, as they are generally driven by political agendas and pursuing the basic aim of recognition by their own government. Nevertheless, there are other groups which may consider the use of WMD, and these include those facing extinction, extreme environmentalist groups, and small terrorist groups that reject society, lack realistic political goals, but miscalculate the consequences of such an attack.

Terrorists in the modern era may soon have greater access to both technical skills and equipment to cause enormous destruction. With the end of the Cold War, there were many Eastern bloc scientists ready to sell their knowledge of WMD to the highest bidder. The distribution of WMD has also been facilitated by the fact that certain states have lost the ability to control the storage and movement of such weapons. To date, most terrorist attacks have been constrained by conventional munitions and delivery systems. However, the

international network of contemporary global terrorists is allowing the transfer of more advanced technologies and training across international boundaries, possibly in a way not seen before. The A.Q. Khan network represented the worst proliferation of WMD technology in the modern era. Modern societies, in particular, are highly susceptible to terrorist attacks using WMD as a result of which they could sustain mass casualties. This vulnerability is mainly due to the availability of the weapons, the porous nature of international borders, the societies in which we live, and a preponderance of densely populated cities. Because of the global proliferation of WMD, the means to carry out extreme acts of violence are more available than they have ever been before.

Several factors have conspired to prevent the frequent use of WMD in terrorist attacks to date, including the key consideration that in most cases the use of WMD will not enhance terrorist chances of achieving their objectives. However, some of these constraints have been gradually eroding thus making terrorists more likely to use WMD in the future. The levels of violence involved in terrorist incidents are progressively increasing, with growing numbers of people who understand the technology involved. The consequences of an attack might include some combination of mass casualties, panic, contamination of real estate, damage to the economy, and possibly to the victim country's strategic position.

There is a very real threat of a terrorist attack involving the use of WMD in the future. This is because the motivations, intentions and capabilities exist and the pressures that seem to have prevented the frequent use of WMD to date are being weakened. Despite this, however, nuclear weapons are the most expensive and difficult to acquire and deliver. A technologically advanced infrastructure is required to manufacture them. Radiological weapons are more likely to appeal to terrorists and so the greatest threat comes from stolen radioactive material being used in a conventional device, thus making nuclear leakage of continuing concern.

The International Atomic Energy Agency (IAEA) has documented around fifteen cases of theft of Highly Enriched Uranium (HEU) or plutonium confirmed by the countries concerned. There are additional well-documented cases that the countries involved have not yet been willing to confirm. In many of these cases, the thieves and smugglers were attempting to sell the material to anyone who would buy it and the terrorist groups have been seeking to buy it. A dirty bomb, also referred to as a radiological dispersal device, would be far easier for terrorists to make. Unlike the plutonium or HEU needed for a nuclear bomb, radioactive materials that might be used in a dirty bomb exist at numerous locations all across the globe in both the civilian and military sectors.

Various terrorist groups at different times have been known to be seeking nuclear weapons. Osama bin Laden and his followers have repeatedly attempted to acquire stolen nuclear material and to recruit nuclear expertise. Al Qaeda leadership had met with not only Pakistani nuclear scientists but it also attempted to purchase HEU from Sudan. The Japanese cult Aum Shinrikyo also tried to acquire nuclear weapons in the 1990s before it decided to go for sarin. The Russian intelligence has repeatedly warned that Chechen groups intend to seize nuclear materials and use them to build WMD. Despite various claims, however, there is no convincing evidence that any terrorist group has yet succeeded in getting a nuclear weapon or the requisite HEU or plutonium needed to make one.

It is more difficult to ascertain the full extent of the world-wide proliferation of chemical and biological weapons (CBW) as it is easier to hide the evidence of related programmes. Nevertheless, there has been a steady growth in the number of countries developing the capabilities, despite international treaties aimed at preventing proliferation. These weapons present better opportunities for the non-state actor as weapons capable of causing mass casualties can be manufactured in the smallest of production sites, using materials that are increasingly and legitimately available world-wide.

Chemical and biological weapons offer some intrinsic advantages over nuclear. They cannot be detected by traditional anti-terrorist sensor systems. There can be a time lag between an agent being released and the effects on the victims appearing, thus allowing the terrorist to escape. Some agents lack a clear signature which may enable to disguise the cause of death. They could be used in small demonstration attacks that would indicate both the capability and the resolve to carry out further attacks. Chemical and Biological weapons are capable of inflicting mass casualties and could instil terror into a nation. Finally, they are relatively easy and affordable to produce or acquire, particularly in comparison with nuclear weapons. Between the two, however, it is likely that biological weapons will become the weapon of choice for terrorist groups in the future. Their lethality, even in small quantities, makes them highly potent whereas chemical weapons are not easy to store and their dissemination is weather dependent against outdoor targets.

Given the complexities involved, it is not surprising that most states are struggling to come up with coherent policy responses to this threat even though the debate on the use of WMD has been an issue of topmost priority ever since the Tokyo subway attack. The Japanese authorities failed to prevent the Tokyo attack, despite numerous warning signs, because of a combination of poor domestic intelligence, a lack of WMD terrorism precedents, and Japan's sensitivity to religious freedom.

Dealing with the problem of WMD terrorism can be achieved in two ways. The first is to establish plans that will reduce the likelihood of an attack, and the second is to reduce the impact of an attack should one occur. An effective solution would strike a balance in allocating resources and efforts between the two. Low level initiatives can be undertaken that do not require significant financing. Efforts to reduce the likelihood of an attack must persuade the traditional terrorist not to go down the line of WMD terrorism, and to make sure that those committed to using WMD

do not have the opportunities to acquire or use them. Intelligence organisations will play a crucial role, and international cooperation remains a fundamental requirement. There is an urgent need to enhance the capabilities of detection equipments. To ensure the consequence management phase is effective in reducing the impact of an attack, robust coordination between emergency responders must be established. Adequate resources must be made available to deal with the situation, and in particular the medical services must have plans to cope with surge capacity.

A coherent approach, therefore, is needed to be developed across all departments and at all levels. An overarching strategy and policy is the need of the hour to unify the many diverse agencies involved including the Ministries of Home, Health, Defence and External Affairs as well as the intelligence agencies and local authorities. Moreover, a national database should be created to determine the availability of all specialist personnel and equipment including those from the civil sector, thus allowing regional response teams to be activated and deployed rapidly to an incident. Strategic analysis must be conducted to establish risk management criteria, evaluate the effectiveness of the current response arrangements, estimate casualties and identify the critical capability shortfalls, especially with regards to equipment and training.

Given the financial constraints faced by various government departments, it is essential that central government funding be allocated to procure detectors, monitors and protective and decontamination equipment for first responders and medical teams. Similarly, additional resources must be invested in a national training programme, initially for emergency services in all major cities and subsequently extended to the whole country. There will never be enough resources to protect all of the people all of the time, so the response must strike a balance that is affordable in the short-term but does not place national security at risk in the long-term. Further research and development of vaccines, antibiotics and medical countermeasures should be undertaken and, based on casualty estimates

the Ministry of Health should consider stockpiling these in major cities. Joint exercises should be undertaken at regular intervals and expanded to practice all levels in consequence management using realistic scenarios. The Ministry of Defence should have a number of specialists and wherever possible these should be fully integrated into planning and exercises. The threat of WMD terrorism is steadily increasing and sooner or later an incident, no matter how small, could prove disastrous if a nation remains poorly prepared. Waiting for such an event to prompt a properly funded response programme is irresponsible. WMD terrorism is a low-probability, high-consequence threat that demands that the government not only invests in preventive measures but also undertakes extensive and comprehensive consequence management planning and preparation.

Australia Group

Dr. Rajiv Nayan

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Changes in the Australia Group may be attributed to the threat perception of the member states of the Group. Sometimes, the threat perception and the thinking of a dominant group or sometimes only a dominant power within a dominant group plays a prominent role in shaping the activities of the group.

In 1984, a report, of a special investigatory commission appointed by the United Nations Secretary General, pointed the finger at western countries for supplying chemical agents used in the Iran-Iraq war as weapons. This frightened and prompted some western countries to set up Australia Group to avoid such an occurrence in the future. It was called the Australia Group because Australia initiated the move to organise the first meeting in Brussels in June 1985. Ever since its formation in 1985, the Australia Group always searched for legitimacy and the rationale for its existence. Somehow, it found one or another. In the initial years, when it was formed to control merely chemical agents and precursors for chemical warfare, the question on the legitimacy was raised because of its informal and somewhat secretive existence. It was considered a club of the western countries which had already formed similar clubs to control goods and technologies in different fields to throttle economic development of third world countries.

The Coordination Committee on Multilateral Exports controls popularly known as COCOM used to control goods and technologies through the International Munitions List, the International Atomic Energy List and the International Industrial List which later in 1990 renamed as the Core List. Of all the lists, the International Industrial List, or Industrial List or later incarnation the core list which has been controversial because of its control of dual use goods and technology. Dual-use technology is self-explanatory; it is used for both military and peaceful purposes. After the COCOM was dissolved in 1994, the move to set its successor began. In 1995, an agreement to set up a new body was arrived at, and by 1996, initial elements were announced. This new body was named Wassenaar Arrangement. Its mandate was to control transfers of conventional arms and dual use technologies not covered under other regimes existing in 1996.

There are three proliferation related regimes. The Zangger committee and the Nuclear Suppliers Group (NSG) were the informal groupings to control nuclear commerce. In

1971, the supplier countries of the Nuclear Non-Proliferation Treaty (NPT) formed the Zangger committee after finding the provisions of the treaty inadequate and ambiguous. The objective of the Zangger Committee was to provide standard interpretation or add to clarity to the provision of the Article 3¹ of the NPT. The NSG which was formed in 1975 in the wake of the 1974 Indian nuclear test had almost the same objective. It was formed to bring important non-NPT member countries such as France and Japan into the control framework. The NSG, also known as the London club, had somewhat dubious existence for years. After the Cold War, it acquired a comprehensive mandate, and to a great extent made the Zangger Committee superfluous. In 1987, came the Missile Technology Control Regime into existence to control unmanned aerial vehicles in a specified category. However, in 1993, the parameters were made redundant after the plenary meeting that year asked the member states to deny technology if it contributes to the development of Weapons of Mass Destruction.

All the multilateral regimes of export controls, over the years, are struggling to demonstrate that the element of secrecy has been overcome, and the regimes have become transparent. The Australia Group has also taken some measures such as setting up of website, working with some international treaties and organisations, reaching out to some non-members through its outreach programmes and attempting to broaden its membership. All these activities pose a serious question: has Australia Group transformed itself dramatically after its establishment in 1985? The answer to it is that despite maintaining its close character and informal nature, the Australia Group has tried to change itself to appear relevant in its objective.

Changes

Changes in the Australia Group may be attributed greatly to the threat perception of the member states of the Group. Sometimes, the threat perception and the thinking of a dominant group or sometimes only of a dominant power within a dominant group plays

a prominent role in shaping the activities of the group. The group was started with the objective of stopping Iraq from diverting chemicals and equipment procured through legitimate trade to weapons. Though its basic objective is to target countries of concern like Saddam Hussein's Iraq, yet it has shifted its focus considerably on non-state actors. Of the three Weapons of Mass Destruction, chemical and biological weapons are considered quite susceptible. After the September 11 incidents in general and the anthrax incidents in particular, biological terrorism grabbed the limelight, and made the member states to pay extra attention to it.

Control of Biological agents is the most important addition in the scope of Australia Group. In 1990, in a meeting, the members of the Australia Group decided that the regime would control both chemical and biological agents beside toxins and precursors for chemical warfare. Control of dual use equipment for biological agents production was also covered. The initial control list published in 1992 had eighteen bacteria, four rickettsiae, 25 viruses, and fourteen toxins. The list got updated frequently. In the 2008 plenary meeting, considering the rate of growth in synthetic biology the Australia Group decided to set up a synthetic biology advisory body to get information on developments of technology in the field, and to provide needed responses to the developments.

Thus, the current Australia Group common control lists are divided into five principal categories: chemical weapon precursors, dual-use chemical manufacturing facilities and equipment and related technology, dual-use biological equipment and related technology, biological agents, plant pathogens, and animal pathogens. However, the Australia Group guidelines give significant discretion to the governments of member countries to "(a) apply additional conditions for transfer that it may consider necessary; (b) apply these guidelines to items not on the Australia Group control lists; and (c) apply measure to restrict exports for other reasons of public policy consistent with its treaty obligations."

Another important area of change is in its membership. Though the Australia Group remains a small group body, yet its membership increased from the sixteen founding members to forty countries plus the European Commission. In the membership list of the Group we may find several former Soviet bloc countries such as Ukraine, Poland, Romania and Czech Republic. All the former East European countries which had joined the European Union also joined the multilateral export control regimes like Australia Group. Russia has not become part of the European Union, but has joined all the multilateral export control regimes except Australia Group. In the membership list, we may also spot some developing countries such as Argentina.

Changes may also be witnessed in terms of tools it had deployed to control exports of chemical and biological agents. Brokering, trans-shipment, catchall (control of a non-listed item if it is suspected of contributing to chemical and biological weapon development), End-use certificate, no undercut policy, deemed Export (transfer of knowledge to an alien staying in the supplier country)/Intangible Technology transfers (knowledge based transfer) and so on have emerged as new gadgets of export controls. All these devices have been adopted in all the nonproliferation multilateral export control regimes, including Australia Group.

Through these changes the Australia Group has been trying to justify its existence, still the advent of Chemical Weapons Convention, and the existence of the Biological and Toxin Weapons Convention raised a question mark on the rationale of the existence of the Australia Group. Even the argument that new items and items additional to Chemical Weapons Convention control list may be effectively controlled through a small group like the Australia Group failed to convince a strong section of the international community. However, in the near future, the world does not see any possibility of dismantling of the group. The member states of the group needs to be encouraged to more actively participate in the truly representative body like the Organisation for Prohibition of Chemical

Warfare, and strengthen universal treaties such as Chemical Weapons Convention and the Biological and Toxin Weapons Convention.

Endnotes:

1. The third article has four sub-clauses:
 - The non-nuclear weapon states undertake to accept the IAEA safeguards with the purpose of verification that the nuclear energy is being used for peaceful purposes and has not been diverted to the production of nuclear weapons or other nuclear explosive devices. The safeguards would be applicable to all source or special fissionable material in all peaceful nuclear activities within the territory of such state, under its jurisdiction or carried out under its control anywhere.
 - Each party state undertakes not to provide fissionable material or the equipment or material designed to process, use or produce fissionable material to any non-nuclear weapon state for peaceful purposes unless the material is subject to IAEA verifications.
 - The safeguards will be implemented in a manner which does not hamper the economic or technological development of the other parties or the international cooperation in the field of peaceful nuclear activities.
 - Non-nuclear-weapon States Party to the treaty shall conclude agreements with the IAEA within 180 days from the original entry into force if the treaty in accordance with the IAEA statute. States which deposit their instruments of ratification after the 180-day period, the negotiations will commence not later than the day of deposit.

Israel and Biological Weapons

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The fragile security situation Israel has experienced since its founding has determined its policies regarding the pursuit of unconventional weapons. Information regarding its biological quest, known to have begun as early as 1948, is dealt with extreme secrecy and sensitivity. Analysts however note that Tel Aviv considered biological weapons to be a less effective deterrent than chemical or nuclear weapons. Israel on its part has maintained that it will not be the first to introduce weapons of mass destruction (WMD) into the Middle East. It has also supported the establishment of a WMD-free zone in the region.

Introduction

The unique circumstances leading up to its founding and the fragile security situation it has experienced since then have determined Israel's policies regarding the pursuit of unconventional weapons. The development of nuclear weapons capability is a prime example of Israel's felt imperative to secure national survival in the face of what it perceived to be a hostile regional security environment. While research (and speculation) into aspects of its nuclear quest are well known, the development of its chemical and biological weapons (CBW) capabilities have not elicited similar kind of scrutiny.

The Biological Quest: Secrecy and Sensitivities

Israel's biological quest is reported to have begun as early as in 1948 when a unit dedicated to biological warfare was set up within the HEMED, the science department of the Israel Defence Forces (IDF), called the HEMED BEIT. The unit later moved to its permanent location at Ness Ziona, outside Tel Aviv, where the Israel Institute of Biological Research (IIBR) was established in 1952. The IIBR has been at the forefront of conducting research into various aspects of biological (and chemical) warfare. It is pointed out that IIBR's capabilities and expertise are "consistent with a full array of activities associated with a sophisticated BW (biological weapons) program."¹ Work at IIBR included research into toxins, agents, pathogens, chemical incapacitants, among other aspects. The fact that research on these issue areas has both civilian and military applications points to the difficulties involved in distilling the specifics of an offensive BW programme. This made it more difficult due to the massive secrecy surrounding the functioning of institutions like the IIBR. Analysts have pointed out that its operating budgets have also not been revealed and scientists working on its staff are reportedly sworn to strict secrecy regarding the nature of their work. Strict censorship which still envelops information regarding a former top scientist

at IIBR, Marcus Klingberg, who was convicted of being a spy for the Soviet Union and sentenced to an 18-year prison term in 1983, exemplify the extreme sensitivity with which the Jewish state deals with these aspects.²

It is worth noting however that primary research into dangerous biological pathogens is not prohibited under Article I of the 1972 Biological and Toxin Weapons Convention (BTWC) – which Israel has not signed or ratified. The 1925 Geneva Protocol (which Israel acceded to in 1969), also does not prohibit the developing, stockpiling, and producing of biological weapons, though it does prohibit their use in warfare.³

WMD in the Middle East: The Arab Factor

Israel has for long maintained that it will not be the first to introduce weapons of mass destruction into the Middle East. It has also supported the establishment of a WMD-free zone in the Middle East.⁴ The verifiable renunciation of the WMD programmes of the Arab states has been an important caveat that Israel has held on to, along with the establishment of ‘comprehensive peace’ with the Palestinians.⁵

The Arab states on their part embarked on building chemical and biological arsenals (as well as ballistic missiles) as a counter to the Israeli nuclear endeavor. The extensive chemical and biological weapons programmes of Egypt in the 1960s and Iraq in the 1990s conversely also worried Israeli decision-makers.

Egypt is known to have used chemical weapons in the Yemen civil war - in 1963 and twice during 1967. Reports noted that concerns of a possible use of chemical weapons in the Six-Day War of 1967 prompted Israel to buy thousands of gas masks. However, some sources also noted that the possibility of an Israeli retaliation in kind had prevented the Egyptians from using the chemical option.⁶ During the 1973 Yom Kippur war, Egypt reportedly prepared its chemical arsenal for possible use. Egypt’s military chief also warned

Israel in 1975 of using his country’s non-conventional arsenal if Israel resorted to the use of its nuclear option.⁷

Iraq on its part did extensive research and mass produced various biological agents like botulinum toxin, anthrax, chlostridium perfringens, potent carcinogens like aflatoxin, defoliants, among other deadly ingredients in work that was done at more than 7 research centres.⁸

Deterring WMDs: Nuclear vs Chemical and Biological

To counter the Arab states’ biological and chemical arsenals however, Israel considered biological weapons to be a less effective deterrent than chemical or nuclear weapons. This was due to the lack of visible and immediate effects caused by biological weapons and the relatively long incubation period required for these agents to become active. Also, their effectiveness depended on the method of dispersal, the prevailing weather conditions, among other factors.⁹

In the 1991 Iraq war, Saddam Hussein rained nearly 40 Scud missiles on Israeli population centres. Some analysts have pointed out that the Iraqi leader did behave rationally in not launching biologically or chemically tipped missiles, as that would have made Israel respond “with the same merchandise.”¹⁰

In the aftermath of the war, the Special Means Bureau was established at the Israeli Ministry of Defense to oversee and coordinate all activities in the non-conventional field.

Alleged Use of Biological Weapons

Israel has been accused of using biological weapons in 1948. The charges of alleged usage include the poisoning of wells in Arab villages to prevent them from returning, inducing of a typhoid epidemic in the Arab town of Acre, and attempts to poison wells in Gaza.

In recent times, reports have also speculated that Israel was working on genetically-targeted biological weapons.¹¹ The Palestinian Al-Aqsa Matyr's Brigade has also claimed that they had produced over 20 kinds of chemical and biological weapons after a three-year effort.¹²

Conclusion

The dual nature of bio-technology makes it a double-edged sword. While its positive effects need to be harnessed for society's good, mechanisms like the BTWC have to be further strengthened and effectively implemented. The strong taboo that exists against biological (as well as nuclear and chemical use) is a positive that has to be sustained. Given the concerns generated by an unstable and volatile Middle East, it is to be hoped that countries of the region would find common mechanisms to address their security concerns in a mutually satisfying manner, and not resort to the development or the use of 'weapons of last resort.'

Endnotes:

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2. Avner Cohen, "Israel and Chemical/Biological Weapons: History, Deterrence, and Arms Control," *Nonproliferation Review* Fall/Winter 2001, pp. 27-53.
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4. See Avner Cohen and Benjamin Frankel, "Opaque Nuclear Proliferation," *The Journal of Strategic Studies*, Vol. 13, No. 03, Sept. 1990, pp. 14-44.
5. See Lionel Beehner, "Israel's Nuclear Programme and Middle East Peace," Council for Foreign Relations, February 10, 2006, at http://www.cfr.org/publication/9822/issr_ae1s_nuclear_program_and_middle_east_peace.html
6. See Cohen, "Israel and Chemical/Biological Weapons," p. 42.
7. Ibid.
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9. Cohen, "Israel and Chemical/Biological Weapons," pp. 40-45.
10. Gerlad M. Steinberg, "Parameters of Stable Deterrence in a Proliferated Middle East: Lessons from the 1991 Gulf War," *The Nonproliferation Review*, Fall-Winter 2000, pp. 43-60.
11. See "Israel/Biological/Chronology," at http://www.nti.org/e_research/profiles/Israel/Biological/3652.html
12. *The CBW Conventions Bulletin*, No. 72+73 (September 2006), p. 37. Cited in "Israel/Biological/Chronology: 2004-2007," at http://www.nti.org/e_research/profiles/Israel/Biological/3652_4694.html

Chemical and Biological News

DISARMAMENT

OPCW Director-General Visits The Russian Federation: New Chemical Weapons Destruction Facility at Leonidovka Commissioned

The Organisation for Prohibition of Chemical Weapons (OPCW) Director-General, Ambassador Rogelio Pfrirter, paid an official visit to the Russian Federation from June 16-28, 2008 to attend the official event marking the commencement of the new Leonidovka chemical weapons destruction facility in the Penza region.

The Director-General welcomed the commissioning of the new facility, which will allow the Russian Federation to make further progress in fulfilling its obligations under the Chemical Weapons Convention (CWC). He highlighted the significance of the event as evidence of the Russian Federation's strong commitment to complete the destruction of its chemical weapons stockpiles by 2012, in accordance with the Chemical Weapons Convention (CWC).

Mr. Victor Kholstov, Deputy-Director of the Federal Industry Agency, Head of the Russian Chemical Weapons Destruction Program, highlighted the significance of the occasion and reiterated the commitment of the Russian Federation to fulfil its obligations under the CWC in a full and timely fashion and within the deadlines set by the Convention.

General Valery Kapashin, Head of the Federal Department for Safe Storage and Disposal of Chemical Weapons, stated that all the remaining destruction facilities in Russia will be built and commissioned on time.

The chemical weapons destruction facility in Leonidovka is the fourth chemical weapons destruction facility to have begun operation under the auspices of the Russian Federation's Federal Programme to destroy its total declared stockpile of 40,000 metric tons of chemical

warfare agents, in accordance with the CWC. It will be used to destroy 6,884.794 MT of GB (sarin), GD (soman), GD viscous and VX nerve agents, which constitutes about 17.7 percent of Russia's declared chemical weapons stockpile. The Government of Switzerland has contributed CHF 3,000,000 to the Leonidovka facility.

During the destruction process, OPCW inspectors will maintain a 24 hour presence at the facility to ensure that all chemical weapons at the site are irreversibly destroyed.

OPCW implements the Chemical Weapons Convention. Under the Convention, all chemical weapons and their production capacity are to be completely eliminated within a stipulated timeframe and under international monitoring.

<http://www.opcw.org/June 20, 2008>

RECENT DEVELOPMENTS IN SCIENCE AND TECHNOLOGY

New technique can detect biological, chemical and explosive agents

Airplane passengers and baggage might be screened one day by a machine under development at Lawrence Livermore National Laboratory (LLNL) that can detect explosive, chemical and biological agents all at the same time.

A team of LLNL researchers has conceptually proven that a three-in-one machine, or "universal point detection system," can be achieved, said George Farquar, a postdoctoral fellow and physical chemist at the Lab's Glenn T. Seaborg Institute.

The team's latest advance, using its mass spectrometry system to detect the presence of minuscule particles of explosives, is described in the March 1 edition of *Analytical Chemistry*, a semi-monthly journal published by the American Chemical Society.

"We have found we can potentially detect an incredibly small quantity of material, as small as one dust-speck-sized particle weighing one trillionth of a gram, on an individual's clothing or baggage," Farquar said. "This is important because if a person handles explosives they are likely to have some remaining residue."

Using a system they call Single-Particle Aerosol Mass Spectrometry, or SPAMS, the Livermore scientists already have developed and tested the technology for detecting chemical and biological agents.

The new research expands SPAMS' capabilities to include several types of explosives that have been used worldwide in improvised explosive devices and other terrorist attacks.

"SPAMS is a sensitive, specific, potential option for airport and baggage screening," Farquar said. "The ability of the SPAMS technology to determine the identity of a single particle could be a valuable asset when the target analyte is dangerous in small quantities or has no legal reason for being present in an environment." The team conducted its explosives tests under laboratory conditions at LLNL last summer.

"The tests went well. They show the potential to identify explosives in a field setting," Farquar said. Besides Farquar, other LLNL researchers on the explosives detection team included the paper's lead author, Audrey Martin, an LLNL chemist and Michigan State University Ph.D. student, chemists Eric Gard and David Fergenson, and physicist Matthias Frank.

The early history of the three-in-one detection system started at LLNL in 1999 with the development of what is called the Bioaerosol Mass Spectrometry (BAMS) system. This system can detect airborne biological pathogens and sound a warning in less than one minute.

In late 2005, Livermore researchers started work to expand the capabilities of BAMS to include chemicals and explosives, setting the stage for the new machine now called SPAMS.

"While this instrument started as a biological detector, we saw that it had the potential to do much more by detecting other threat agents, such as chemicals and explosives," Farquar said. The biological detection system underwent field testing for background studies at San Francisco International Airport in late 2005. Farquar describes the biological detection technology "as very solid."

In late 2005, the biological system underwent testing for several biological "surrogates" at the Applied Physics Laboratory at Johns Hopkins University. A second round of tests – with smaller releases and seven days of autonomous sampling – is planned for later this month.

Initial studies to test the performance of SPAMS with four chemical "simulants" were undertaken in 2006.

Future plans for SPAMS include a field test at a large public facility in the United States later this year, upgrading the technology for removing particles from luggage and clothing, and adding the capability of detecting narcotics, Farquar said. Research funds to add the capabilities of detecting explosives and chemicals have been provided by the Defense Advanced Research Projects Agency, the U.S. Department of Homeland Security and LLNL's Glenn T. Seaborg Institute, which is part of the Chemistry, Materials and Life Sciences directorate.

Founded in 1952, Lawrence Livermore National Laboratory has a mission to ensure national security and to apply science and technology to the important issues of our time. Lawrence Livermore National Laboratory is managed by the University of California for the U.S. Department of Energy's National Nuclear Security Administration.

<http://rinf.com/alt-news/contributions/new-technique-can-detect-biological-chemical-and-explosive-agents/3963/>
June 24, 2008

Plastic bottles are deadly for your brain

Plastic containers may be deadly for your brain. Canadian researchers have found that Bisphenol A (BPA), the chemical used in making plastic containers, might be responsible for impairing many brain functions such as learning and remembering.

They also fear that it could be a factor behind Alzheimer's, schizophrenia and depression.

BPA is globally used in making plastic water bottles, baby food bottles, food containers and dental prostheses.

In their study, the researchers at the University of Guelph found that BPA might be leaking into the solid or liquid foods kept in the plastic containers.

When these foods and liquids are consumed, they said, the chemical might be getting into the human system, disrupting communication between brain neurons which is vital in understanding and remembering.

According to researcher Neil MacLusky, the slow doses of this chemical badly impair the formation of synapses in the areas of the human brain linked to learning.

As part of their study, the researchers fed African green monkeys at St. Kitts Island with foods containing low levels of BPA for a month.

After that period, they found that the chemical had slowed down the synapses in the monkey brain.

MacLusky said this process was linked to the hormone oestrogen.

"Oestrogen enhances the rate at which some types of synapses are formed and is vital in maintaining normal neuronal structure in regions of the brain that control learning, memory and mood state," he said in a TV interview.

When monkeys had BPA in their system, he said, it seriously impaired this process, affecting their ability to remember.

<http://timesofindia.indiatimes.com/articleshow/msid-3444053,prtpage-1.cms>

Robot Has Biological Brain

Scientists have created a robot controlled by a biological brain made of rat neurons.

The robot, named Gordon, is not exactly an Einstein but represents a remarkable bridging of the gap between biology and technology. Gordon relies a dish with about 60 electrodes to pick up electrical signals generated by the brain cells.

The brain drives the robot's movements. Every time the robot nears an object, signals are directed to stimulate the brain by means of the electrodes, the researchers explained in a statement released by the University of Reading in England. In response, the brain's output drives the robot's wheels left and right, so that it moves around in an attempt to avoid hitting objects.

The robot has no additional control from a human or a computer, the scientists state. Its sole means of control is from its own brain.

"This new research is tremendously exciting as firstly the biological brain controls its own moving robot body, and secondly it will enable us to investigate how the brain learns and memorizes its experiences," said the university's Kevin Warwick of the School of Systems Engineering. "This research will move our understanding forward of how brains work, and could have a profound effect on many areas of science and medicine."

The researchers aim to get the robot to learn, by applying different signals as it moves into predefined positions. That might allow them to witness how memories manifest themselves in the brain when the robot revisits familiar territory. They hope the work will eventually

lead to a better understanding of Alzheimer's, Parkinson's, stroke and brain injuries.

"One of the fundamental questions that scientists are facing today is how we link the activity of individual neurons with the complex behaviors that we see in whole organisms," said Ben Whalley, a pharmacist at the university and member of the team that built Gordon. "This project gives us a really unique opportunity to look at something which may exhibit complex behaviors, but still remain closely tied to the activity of individual neurons. Hopefully we can use that to go some of the way to answer some of these very fundamental questions."

The project was funded by the UK Engineering and Physical Sciences Research Council.

<http://www.livescience.com/technology/080814-robot-brain.html>

New nano device detects immune system cell signaling

Scientists have detected previously unnoticed chemical signals that individual cells in the immune system use to communicate with each other over short distances.

The signals the researchers detected originated in dendritic cells – the sentinels of the immune system that do the initial detection of microscopic invaders – and were received by nearby T-cells, which play a number of crucial roles in the immune system, including coordination of attacks on agents that cause disease or infection.

The chemical signals cells exchange when they come into contact have been studied extensively. But it has not been possible to detect chemical messages that travel between cells that are nearby but not in contact – called paracrine signals – because they are highly localized and they are produced in concentrations that have been below detection levels. A new technology, called a multi-trap nanophysiometer, was required to demonstrate the existence of non-contact signaling. This is

one of the first microfluidic devices that has been applied successfully to the study of cell-to-cell signaling in the immune system.

A detailed description of the multi-trap nanophysiometer (MTN) and how it enabled the accidental discovery of paracrine signaling has been published online by the Lab on a Chip journal. The new device was developed by a team of researchers at the Vanderbilt Institute for Integrative Biosystems Research and Education headed by John P. Wikswo, the Gordon A. Cain University Professor at Vanderbilt.

"This is an important advance and potentially very useful technology," says co-author Derya Unutmaz, now an associate professor of microbiology at New York University's School of Medicine. "The ability to study the behavior of single cells may not be as critical if you are studying the heart or muscles, which are mostly formed by uniform cells, but it is crucial for understanding how the immune system functions. The wide surveillance of the body that it conducts requires extensive communication between dozens of different kinds of immune cells."

The reason for this is that the dendritic cells, T-cells and B-cells in the immune system, which tend to concentrate in the lymph nodes spread throughout the body, function as individual, unattached cells. If dendritic cells detect invaders in the body, they rapidly migrate to lymph nodes and have to find the appropriate T-cells to alert them. But how dendritic cells attract the right T-cells among millions of cells within the lymph nodes remains an immunological puzzle.

Scientists have been trying to develop systems for single-cell analysis for a number of years. Because of the difficulty of keeping normal cells alive, they have been forced to use cells that have been genetically altered so they can be cultured indefinitely. Although the alteration "immortalizes" the cells, it also significantly limits their usefulness. The MTN is the first system that can monitor biochemical changes in large numbers of normal or primary cells at the single-cell level for prolonged periods, Unutmaz says.

The new device consists of a series of hair-sized channels molded in a special kind of plastic that is glued onto the bottom of a glass microscope coverslip. A shoebox-sized pump pushes fluid (normally the media used to culture cells) through one channel that opens up into a chamber filled with hundreds of tiny, three-sided wells small enough to trap individual cells. When cells are injected upstream, they are passively trapped in the wells and are held there solely by the fluid flowing out even smaller holes in the well bottoms. By precisely controlling the flow rate, the researchers can keep normal cells alive for longer than 24 hours.

The researchers monitor the cells with a digital camera attached to a standard microscope, typically snapping images every 30 seconds. They have written software that allows them to analyze the movements and reactions of individual cells. They can record various cell behaviors by injecting different fluorescent dyes into the cells. For example, when naive T-cells are primed for an immune response, the concentration of calcium ion in their cytoplasm jumps up. So when the cytoplasm contains a dye that fluoresces when it comes into contact with calcium, it glows brightly enough to be easily detected.

The surprise discovery of paracrine signaling was made by graduate student Shannon Faley, now a postdoctoral research associate at the University of Glasgow, Scotland. She filled up a nanophysiometer chamber with naive human T-cells and then added mature dendritic cells. She was looking for evidence of T-cell activation when the T-cells and dendritic cells were trapped in the same well and came into contact. This contact is part of the process that allows dendritic cells to convey information about potentially infectious invaders to the naive T-cells, which can then begin dividing to produce an army of effector T-cells custom-designed to attack the invaders.

Faley saw what she was looking for, but she also noticed something unexpected: some T-cells that were trapped in wells downstream of those with dendritic cells, which had never been in direct contact with them, were also lighting

up. "My reaction when I saw them was, 'What in the world is going on?'" she says.

"When she saw this, Shannon did a very clever thing," says Wikswo. "She took one chamber and filled it with dendritic cells and took a second chamber and filled it with T-cells. Then she hooked the second chamber downstream of the first." When she did so, the T-cells in the second chamber immediately began lighting up, demonstrating that the mature dendritic cells were releasing a chemical factor that activates naive T-cells without coming into contact.

"At this point we don't know what this factor is or what its function is," says Faley. According to Unutmaz, a logical function for this signal would be to attract T-cells to dendritic cells that have important information to give them. This supposition is strengthened by the observation that immature dendritic cells don't produce this factor but mature immunogenic dendritic cells – those that have encountered a pathogen or danger signal – do.

When Faley tried to duplicate this result using standard immunological techniques, however, the result was negative. The standard method consists of growing a culture of dendritic cells in a culture flask, adding T-cells and looking for a reaction. If the cell density is too great, the cells begin poisoning each other, run out of food and die. So the standard practice is to keep the density at a low enough level that the cells remain healthy when the cell media is changed daily.

"This represents a dilution factor of 100 compared to the nanophysiometer," says Wikswo. "So the factor produced by the dendritic cells was too dilute to activate the T-cells." It wasn't until Faley redid the standard test with cell densities 10 times higher than normal that she got the T-cells to activate.

"This represents one of the advantages of the nanophysiometer; it suspends cells in extremely small volumes that are much closer to what they experience in the body and uses slow fluid flow to keep the cells alive," Wikswo says.

Not only is this capability important in improving our knowledge of how the immune

system works, but it may also be the key to understanding why the system fails, as it does in cases like cancer and HIV/AIDS, says Dana Marshall, associate professor at the Meharry Medical College. She and the Wikswo group have submitted a proposal to use the technique to study triple-negative breast tumors, one of the most deadly forms of breast cancer.

"The ability to look at the signaling among cancer cells and immune cells is extremely powerful," Marshall says. "According to the evidence, the immune system tries to suppress tumor cells but it fails to do so. It is not clear why it fails. If we can figure that out, then we should be able to develop more effective treatments."

In addition, the multi-trap nanophysiometer could provide a better way to identify the most effective forms of chemotherapy to use for each individual, Marshall suggests.

There are enough cells in a typical biopsy to load one chamber with tumor cells and a second chamber with immune-system cells from a patient, subject them to different chemotherapeutic agents and see how the two groups of cells respond. "Often, when therapy fails, the tumor responds to a chemotherapy treatment for a period of time and then it stops. This approach may let us figure out why that happens," Marshall says.

http://www.biologynews.net/archives/2008/09/03/new_nano_device_detects_immune_system_cell_signaling.html

Virus to wipe out malaria mosquitoes

In what could be deemed as a remarkable medical breakthrough, American researchers have discovered a virus which they claim is infectious to the *Anopheles gambiae* mosquito that is responsible for transmitting malaria.

According to them, the virus could someday be used to pass on new genetic information to the *Anopheles* mosquitoes as part of a strategy to control malaria, which kills over one million

people worldwide each year. In fact, the virus, AgDNV, is a denso-nucleosis virus or "densovirus", which are very common to mosquitoes and other insects, but do not infect vertebrate animals such as humans.

Although the virus does not appear to harm the mosquitoes, the researchers at Johns Hopkins Bloomberg School of Public Health have determined that it is highly infectious to mosquito larvae and is easily passed on to humans.

According to the study's lead author Jason Rasgon, the discovery came about serendipitously while the research team was conducting experiments to determine whether Wolbachia bacteria could be used to infect *An. gambiae* mosquito cells. During the analysis, they noticed an "artifact" that appeared as a prominent band in the gel used to detect the bacteria.

"Finding artifacts such as this one during experiments isn't uncommon, but we decided to investigate this one further since we kept observing it over and over. When we sequenced it we're surprised to learn that we found a new virus," he said.

"In theory, we could use this virus to produce a lethal toxin in the mosquito or instruct the mosquito to die after 10 days, which is before it can transmit the malaria parasite to humans. However, these concepts are many years away," he said.

<http://timesofindia.indiatimes.com/articleshow/msid-3404923,prtpage-1.cms>

NATIONAL AND INTERNATIONAL DEVELOPMENTS

Patil warns about threat of bio-terrorism

Warning about the threat of bio-terrorism, Home Minister Shivraj Patil today said there

was a need for better coordination between the Centre and states to meet such a challenge as he unveiled guidelines for biological disaster management.

The guidelines prepared by the National Disaster Management Authority (NDMA) focus on issues related to health, immediate trauma and suffering, mental health and psychological support, identification of vulnerable groups and creation of community awareness to meet the challenges.

After releasing the National Guidelines on Biological Disaster Management, the Home Minister cautioned that biological disasters could spread like wild fire and said biotechnology can be used for causing harm to human beings and genetics can be used as a weapon.

“It is very difficult to predict natural as well as manmade disasters. Therefore, constant vigilance is necessary. And, preparedness is all the more necessary,” he said.

Patil favoured proper cooperation between the Centre and the states, and said coordination between the district and local bodies was all the more necessary to handle biological disasters.

Describing the task of managing such disasters as very difficult, he said a lot of money and vision would be needed. “While there will be no shortage of funds, the cooperation and coordination (at various levels) should be better than what we are doing now,” he said.

Patil also sought cooperation from non-government organisations for better results.

[http://www.ptinews.com/pti/ptisite.nsf/\\$All/B172955E09AB6654652574AD0032E615?Open Document](http://www.ptinews.com/pti/ptisite.nsf/$All/B172955E09AB6654652574AD0032E615?Open Document)

New nerve cells needed for smelling, memory: study

Mature brains need a continuous supply of new nerve cells to sustain functions like smelling

and memory, an experiment with mice in Japan has shown.

While the adult brain can make new nerve cells, experts have never been sure of their roles until now. These findings may explain why some stroke survivors never recover certain faculties because their brains no longer generate new cells. In an article published in *Nature Neuroscience*, the researchers said they found a way to insert a fluorescent protein into adult mice, which helped identify new brain cells.

Over the course of a year, they found that nearly all nerve cells in the olfactory bulb — responsible for smelling — had been replaced with new ones. New nerve cells were also seen in the hippocampus, which is linked to memory.

“These mice were normal and we could tell which were new nerve cells ... and they should be functional,” Ryoichiro Kageyama, director and professor at the Institute for Virus Research in Kyoto University told Reuters.

“We believe those neurons are very important for olfactory system (sense of smell).” In another group of adult mice, the researchers blocked their ability to grow new brain nerve cells.

“Normal mice quickly learn which hole to get to where it’s dark and has bedding. For the mutants, they learn where to hide, but after a week, they totally forget, they completely lose their memory,” said Kageyama.

However, this group of mice continued to be able to smell four months into the experiment. The researchers are waiting to see if that faculty might be affected further out.

“We are waiting a while more to see if there could be loss of the sense of smell,” Kageyama said. He added that the findings had implications for people suffering brain damage.

“In some damaged brains, like after a stroke, there is no neurogenesis (generation of new brain cells). We are interested in knowing

where nerve cells come from, and whether we can stimulate neurogenesis," he said.

http://news.yahoo.com/s/nm/20080831/hl_nm/brain_cells_dc_1

Guinea-Bissau Designates OPCW National Authority

On 19 June 2008 Guinea-Bissau became the 184th State Party to the Chemical Weapons Convention (CWC). In compliance with its obligations as a new State Party to the CWC, Guinea-Bissau has informed the OPCW that it has designated the Ministry of Foreign Affairs as its National Authority.

A National Authority is crucial to ensuring the effective implementation of the CWC within each State Party's national jurisdiction. Article VII, paragraph 4 of the Convention states: "In order to fulfil its obligations under this Convention, each State Party shall designate or establish a National Authority to serve as the national focal point for effective liaison with the Organisation and other States Parties. Each State Party shall notify the Organisation of its National Authority at the time that this Convention enters into force for it."

The National Authority has the responsibility of implementing the provisions of the CWC at the national level. To meet its basic obligations each State Party must be able to submit all the required declarations, communicate with the OPCW, cooperate with other States Parties, facilitate OPCW inspections, respond to OPCW requests for assistance, protect the confidentiality of classified information, monitor and enforce national compliance, and cooperate in the peaceful uses of chemistry. States Parties are also obliged to declare and to eliminate all chemical weapons stockpiles and chemical weapons production facilities. The National Authority plays an indispensable role in all of these activities.

As at 24 June 2008, 177 (96%) of the 184 States Parties to the CWC have established or designated National Authorities.

<http://www.opcw.org/>

Al-Qaeda has confirmed one of its top chemical and biological weapons experts died in an air strike

Abu Khabab al-Masri was killed with three other militants in a suspected US strike in Pakistan.

Masri, who carried a \$5 million bounty on his head, was identified by Pakistani officials as the likely target of the attack on a house in a tribal area bordering Afghanistan.

An Al-Qaeda statement posted on Islamist websites said Masri, referred to as the "expert", had left behind him a generation of students who would avenge his killing.

The statement, attributed to Al-Qaeda's leader in Afghanistan, Mustafa Abu al-Yazid, named three other militants killed alongside Masri on July 28.

But the terror group has denied reports that Al-Qaeda's number two, Ayman al-Zawahri, was killed in the same missile attack.

Masri, a 55-year-old Egyptian chemist, was regarded as one of the group's top bomb makers.

Police in Kenya said one of Africa's most wanted Al-Qaeda operatives, Fazul Abdullah Mohammed, narrowly escaped capture.

Mohamed left an address in the Indian Ocean resort of Malindi just minutes before officers crashed through the door.

The United States has offered a \$5 million reward for information leading to the capture of the Comorian, who speaks five languages and is said to be a master of disguise, forgery and bomb making.

He is accused of playing a lead role in the 1998 embassy attacks in Nairobi, Kenya, and Dar es Salaam, Tanzania, which killed 240 people.

<http://www.channel4.com/news/articles/world/alqaeda+bombmaker+killed/2374977>

Former Sri Lankan rebel commander says LTTE may use chemical weapons as last resort

Former leader of the Liberation Tigers of Tamil Eelam (LTTE) in the Eastern Province and the current leader of the political party TMVP, Vinayagamoorthy Muralitharan alias Karuna Amman said that military defeat is inevitable for the LTTE as it does not have a proper commander.

Speaking at a media briefing in Welikanda, he said the Tigers had lost 60% of their power after his split with them. He added that this is the main reason that the Sri Lankan security forces can now achieve success in the North, and the present trend will not be stopped until the fall of the LTTE.

Speaking further, he argued it was he who had commanded all successful battles fought by the LTTE, and its chief V. Prabhakaran had never faced a single battle during his time in the outfit. Karuna Amman added that Prabhakaran would not be able to come before the public but is now planning to use civilians in the Wanni region as a human shield to save his life.

During the briefing, he also warned that the Tigers may use chemical weapons as their last resort. He confirmed that the Tigers have the weapons but said he was not aware about the exact substance used. He confidently said that Prabhakaran would choose to use the chemical weapons as the last measure to avoid defeat.

http://www.colombopage.com/archive_08/August12171914JR.html

VX supply destruction completed at Indiana depot

An Army contractor has finished destroying a deadly nerve agent stored in Indiana and will dismantle equipment built for the project.

The final container of VX nerve agent was destroyed at the Newport Chemical Depot.

Army site manager Jeff Brubaker says that means elimination of the last of about 275,000 gallons of the nerve agent the site had stored.

VX destruction began at Newport in May 2005 under an international treaty requiring the U.S. to destroy its chemical weapons stockpile.

The Army signed a contract with Veolia (vee-OH'-lee-uh) Environmental Services to ship the waste some 900 miles to a plant in Port Arthur, Texas, for incineration.

Brubaker says the last of the hydrolysate will be shipped to Port Arthur by the end of September.

<http://www.kten.com/global/story.asp?s=8822791&ClientType=Printable>

Sri Lanka: Use of chemical weapons, regardless of place, user and context, is an act of terrorism

Prime Minister Rathnasiri Wickremanayake has assured that the Government of Sri Lanka does not have any chemical weapons or mass destructive weapons in its possession and expressed doubts that the LTTE terrorist outfit might adopt into such military tactics now or later. Mr. Wickramanayake said that he said he was certain of one thing: the LTTE was on its last legs.

'Our security forces have cornered them in their holes in a stretch of wilderness in the North of the country. We expect to be rid of this menace soon, weapons and all, but life must go on and people must always be alert,' the Prime Minister

said inaugurating the regional meeting of Asian Parliamentarians to discuss the national implementation of the Chemical Weapons Convention in Colombo where he was the Chief Guest.

He said that paying attention to such threats should not be evaded as there is a need to guard against possible evil intentions harboured by others now or in the future.

Recalling the Central Intelligence Agency (CIA) describing the LTTE as the most ruthless terrorist outfit in the world, the Prime Minister said "We have to be prepared and alert".

He stressed the need to unite under one umbrella to combat the scourge of terrorism.

"Chemical weapons are weapons of terrorism; there are no peaceful uses for them", he said adding that when the British used gas to kill hundreds of Kurdish people in their wars in West Asia early last century it was terrorism.

"The arch imperialist Churchill justified it saying that 'It is alright to kill niggers'. That was the white man's attitude, a lack of feeling for people of a different colour that accompanied the dropping of atomic bombs which massacred hundreds of thousands of Japanese civilians in Hiroshima and Nagasaki during the World War II and those were weapons of mass destruction and that was terrorism. That was by the Americans, who were later to accuse Iraq's Saddam Hussein of possessing weapons of mass destruction, despite the testimony of their own inspectors that there were no weapons of mass destruction in Iraq."

The Prime Minister also questioned the right such people now have to interfere with human rights issue in Sri Lanka when the country is deeply threatened by the 'World's most ruthless terrorist outfit'.

**[http://www.isria.info/RESTRICTED/
D/2008/AUGUST_28/diplo_27
august2008_29.htm](http://www.isria.info/RESTRICTED/D/2008/AUGUST_28/diplo_27august2008_29.htm)**

Kingdom signs treaty against chemical weapons

Saudi Arabia, along with 186 countries, signed the Chemical Weapon Convention (CWC) treaty prohibiting the use of chemical weapons in Colombo.

We discussed many issues before signing the treaty. The Kingdom's role is to support peace and stand against violence," said Dr. Khalil Al-Khalil, member of the Shoura Council and head of the Security Affairs Commission and the Saudi delegation in Colombo.

Members of the Shoura Council arrived in Colombo early on Aug 25 for the two-day meeting of the Organisation for the Prohibition of Chemical Weapons (OPCW). Major Mohammed Abu-Sak and Saeed Al-Amri, arbitrator member of the Ministry of Foreign Affairs were among other dignitaries.

"This treaty includes many conditions that must be followed by Arab and international countries to ensure world safety," Al-Khalil said. "The treaty prohibits the use of chemical weapons in war and puts a restriction on weapon factories.

All countries that have signed the treaty must declare the number of the chemical weapons they have."

"All countries should be inspected by the (OPCW) authority to make sure they are free of such weapons", he added.

The Kingdom has earlier signed a treaty prohibiting the use of chemical weapons in 1993.

Five prominent countries – Russia, US, Israel, Egypt and Syria – did not take part in the event. Bahrain, Kuwait and Oman from the GCC also did not participate.

**[http://www.saudigazette.com.sa/
index.cfm?method=home.regcon&contentID
=2008082915763](http://www.saudigazette.com.sa/index.cfm?method=home.regcon&contentID=2008082915763)**

Colorado suing for quicker destruction of mustard gas

Colorado is filing suit against the Department of Defense, hoping to force the Army to destroy obsolete chemical weapons stored in the state by 2017.

The military said it could take until 2020 under current funding and staffing levels to eliminate about 2,600 tons of mustard gas stored at the Pueblo Chemical Weapons Depot near Pueblo.

The military says the weapons are outdated and have no military use. The state says the gas is still highly toxic and can cause severe skin and lung inflammation, cancer and birth defects.

The Colorado Department of Public Health and Environment said it had submitted the suit in Denver federal court, but court officials said it had not yet been filed by the end of business. Department of Defense spokeswoman Kathy DeWeese said the military's attorneys had not yet seen the lawsuit.

DeWeese said the military's current timetable calls for starting to destroy the Pueblo stockpile in 2015, finish in 2020 and close the plant in 2024.

State health officials said Colorado regulations bar long-term storage of hazardous waste unless additional quantities are being accumulated for proper treatment, or an alternative schedule has been approved.

The state health department says it has regulatory power over the Army's plans to destroy the weapons, and in June the state issued an administrative order calling for the Defense Department to destroy the weapons by 2017.

Officials said they decided to sue in federal court because the military plans to appeal the order. "We believe the 2017 deadline is more than reasonable to complete treatment and destruction of the chemical weapons," said Gary Baughman, director of the Hazardous

Materials and Waste Management Division of the Colorado health department.

The Army also has chemical weapons stored at the Blue Grass Army Depot in Kentucky.

http://www.examiner.com/print-1567064~Colo._suing_for_quicker_destruction_of_mustard_gas.html

China urges Japan to remove chemical weapons abandoned during WWII

China urged Japan to accelerate the process of removing chemical weapons it abandoned in China during the Second World War.

"We expect Japan to do its utmost to quicken the process of removing abandoned chemical weapons and wipe out the related threats at an early date," Foreign Ministry spokesman Qin Gang told a regular press briefing.

Qin's comments came after a court in Tokyo heard the case concerning two school boys from northeastern China's Jilin Province, who were in 2004 injured by chemical weapons left by Japanese troops in the war and filed a suit early this year.

Qin said abandoned chemical weapons were one of the crimes that the Japanese aggressors committed during the World War II and still posed severe threats to the peoples' life, property and local environment.

"We hope Japan can carry out the Chemical Weapons Convention, honor the commitment in the memorandum it signed with China and take responsibility," the spokesman said.

http://news.xinhuanet.com/english/2008-08/26/content_9716566.htm

Chemical exposure at plant sickens 8

One of two Missouri hospital emergency rooms reopened, a day after being shut down under

quarantine when eight people sickened by a dangerous chemical's release sought treatment.

Price McCarty, an FBI spokesman in Springfield, said the chemical release at the Ro-Corp. plant caused no deaths, countering a statement by an East St. Louis city official that two people had died.

The chemical, which authorities said was likely the highly toxic material nitroaniline, was released when a barrel was dropped at the Ro-Corp. plant.

The eight people sickened - identified by the FBI as mostly Ro-Corp. workers - remained hospitalized.

<http://www.washingtontimes.com/news/2008/sep/01/american-scene-89354153/>

All workers involved in Metro East toxic chemical spill released from hospitals

The eight workers involved in a toxic chemical spill over the weekend at an East St. Louis packaging facility have been released from area hospitals, the plant's parent company said.

Two of them have returned to work and the rest are expected to return to work shortly, according to a statement from G.S. Robins, the parent company of RoCorp, which operates the plant.

The RoCorp site is being cleaned and tested for reopening.

Previous reports of terrorist activity and the death of two involved individuals were false, the company said.

Plant workers were transferring a product known as para-nitroaniline from drums into other packaging when they fell ill. The toxic powder, which is used to make dyes and also acts as a corrosion inhibitor, attacks the respiratory system.

St. Anthony's Medical Center and DePaul Health Center, where some of the workers were treated, quarantined and closed their emergency rooms as a precautionary measure and have since reopened.

<http://www.bizjournals.com/stlouis/stories/2008/09/01/daily24.html?t=printable>

RECENT PUBLICATIONS IN THE FIELD

Countering bio-threats: EU instruments for managing biological materials by Frida Kuhlau, Solna, 2007.

Light at the end of the tunnel: the sixth review conference of the biological weapons, Una Becker, Frankfurt, 2007.

Compiled By: Wg. Cdr. Ajey Lele, Dr. Monalisa Joshi and Gunjan Singh.

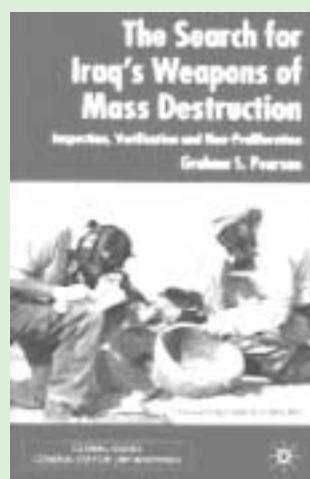
Book Review

The Search for Iraq's Weapon of Mass Destruction: Inspection, Verification and Non Proliferation by Graham S Pearson, Palgrave Macmillan, 2005

Dr. Priyanka Singh

The author is Research Assistant at IDSA, New Delhi.

The book renders a systemic account of the search for chemical and biological weapons in Iraq ever since its war with Iran in the 1980's i.e. across a period of almost two decades. Pearson offers a comprehensive account of the facts related to the search of chemical and biological weapons in Iraq. The case of Iraq pursuing the production of chemical and biological weapons emerged in the backdrop of the Iraq-Iran war and largely within the purview of the cold war.



Graham S Pearson has been engaged in the study of chemical and biological weapons much before he joined the University of Bradford, UK as a Visiting Professor in International Security at the Department of Peace Studies. His expertise in the subject therefore flows evenly through the chapters of this book titled, "*The Search for Iraq's Weapons of Mass Destruction: Inspection, Verification and Non Proliferation*." The book renders a systemic account of the search for chemical and biological weapons in Iraq ever since its war with Iran in the 1980's i.e. across a period of almost two decades. It also strikes the reader with its sense of objectivity and authenticity right at the beginning and by the time it ends, it bequeaths a good deal of intellectual nourishment for people working on this theme.

Graham Pearson has written another book on the same subject titled "*UNSCOM Saga: Chemical and Biological Weapons Nonproliferation*". The foreword to this book has been written by the former Deputy Executive Chairman of the UNSCOM, Charles A. Duelfer. He has given valuable insights on Pearson's newer piece of work. In this book, Pearson offers a comprehensive account of the facts related to the search of chemical and biological weapons in Iraq. The revelations regarding Iraq's usage of chemical weapons against Iran permeated in the world community during Iran-Iraq war of 1980's. Unfortunately at that point there were minimal efforts made to amend the gravity of the situation. Nonetheless with the further deepening of the crisis in the 1990's, international community began to maneuver to put a curb on the dangerous use of chemical and biological weapons amongst warring nations.

As mentioned, the case of Iraq pursuing the production of chemical and biological weapons emerged in the backdrop of the Iraq-Iran war and largely within the purview of the cold war. With the cold war dissipating in due course into a multipolar global order, the threat of the use of chemical and biological weapons had been understated. A new threat however emerged:

the use of the CWC by the so called non state actors or the terrorists.

The book comprises twelve chapters which study the four stages of the search for WMD in Iraq; beginning with the United Nations Secretary General Experts in the 1980's, the UN Special Commission (UNSCOM) from 1991-98, by the UN Monitoring, Verification And Inspection Commission (UNMOVIC), November 2002 to March 2003 and finally the Iraqi Survey Group (ISG) to avert the WMD threat from Iraq's 'uncooperative regime.' Not only this, Pearson also dwells on the reasons as to why against all claims no such deadly stockpiles were located in Iraq during the course of inspection over the years. He puts forth the argument that in contrast to the western concept which believed in the storage of such weapons over a period of time for 'retaliatory capability,' the Iraqi strategy of war digressed and concentrated more on the production and immediate usage of these weapons. At the same time though, Iraq intended to sustain the 'production capability' to cater future requirements. This significant argument could be counted as the unique contribution of this work. The war against Iraq is ostensibly the first war against the proliferation. Therefore the author explores what could be appropriately perceived by terms like inspection, verification and non proliferation coined in such practices.

The introduction is followed by the section which deals with what could be the basis of the entire façade created over Iraq's alleged possession of the chemical weapons. The Iraq-Iran quest for territorial gains and strategic advantage eventuated into long drawn war during 1980-1988. This coincided with the offset of the UN Secretary General investigation in Iraq and Iran. In the times to follow, Iraq invaded the Kuwait in the year 1990 which could be obviated only with the counter offensives undertaken by the US led coalition forces and subsequently resulted in the imposition of ceasefire SCR 687 in 1991. The UNSCOM incepted thereafter to continue the similar task till the year 2000. The author admits that this particular chapter draws major inputs from his aforementioned book titled book UNSCOM Saga. Here Pearson opines

that not much has been written about the actual business of the UNSCOM and its work has not been analysed adequately in the context of the non proliferation goals.

The author efficaciously deals with the run up for the second war against Iraq in March 2003. In this context he quotes both the UK Governor Dossier September 2002 and the US CIA Report of October 2002 also tabulates it in a comparative form to facilitate better understanding. It was based broadly on the judgment of these documents that the coalition forces once again launched attack on Iraq with firm belief that it was in possession of WMD. In this aspect, the author argues in favour of fair assessment of the threat posed by chemical and biological weapons which could be ensured only if these exercises are not politically motivated to suit a particular nation's international pursuits.

The author dwells upon the futuristic roles of UNMOVIC expertise in dealing with the WMD threat significantly as its assignment in Iraq has taken a passive course. In the six options advised, Pearson advocates some sort of collaborative endeavors of UNMOVIC with other international organizations and establishments such as UN and the IAEA to procreate effective curbs on the production and cataclysmic usage of WMDs.

The author concludes by saying that the international order has undergone enormous change and therefore the strategy of non proliferation requires suitable and timely alterations. The Iraq experience to a great extent has urged the world to look into the lacunae of such exercises and instead make them more worthwhile. The call is to forge a better understanding amongst nations who desire to wish away the chemical and biological weapons forever.

The book encapsulates the inspection of WMD in Iraq in entirety and in this respect it is undoubtedly a comprehensive and authoritative work. Never in the course of nearly three hundred odd pages, has the author lost the focus of his study. The author's claim of providing a factual comprehensive study

seems to have weight and he has to the extent fullest provided an unbiased and authentic account. He has been careful not to tangle in the intricacies of motives and political biases involved in handling the situation in Iraq. His study is throughout objective and factually crisp. On a critical note, the book at times seems to lose its analytical fervour with the abundance of data and figures. Nonetheless, it is a valuable contribution in the field of non proliferation and a must read for somebody curious about the case of WMD in Iraq.

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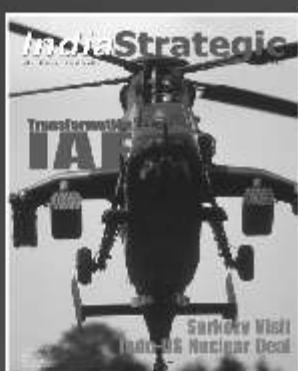
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