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Dual Use Technologies and Arms Control: New Weapons Technologies Challenge Established International Norms

Robert H. Latiff

When we think about arms control and disarmament, we generally are concerned with weapons, not technology. In the past, governments invested in and controlled technologies that were then implemented in weapons of war. To date, it has been governments which have engaged in important debates about nuclear arms reduction treaties or conventions banning weapons of mass destruction such as chemical or biological weapons, or weapons which result in superfluous suffering like land mines. Dual use technologies present a different dilemma in that they have the potential to be used in both good and malevolent ways. While the technologies themselves are not the subject of treaties and conventions, we are now faced with controlling weapons employing these technologies. The difficulty of the task is amplified by the fact that these technologies are also far more readily available to both state and non-state actors.

Especially in recent years, the evolution of war has driven, or perhaps been driven by, the evolution of technology. Historically, advances in technology have changed the nature of warfare. From the introduction of armored vehicles, to nuclear weapons, to the jet engine, to smart weapons, etc., technology has raised the stakes in war. American forces have been exceptionally dependent on technology. From RADAR and precision bombsights in WWII through the ever more powerful nuclear weapons of the Cold War, the Strategic Defense Initiative of the 1980s, the high-tech Desert Storm war in 1990, and the “Shock

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JONATHAN EDWARD SCHELL
AUGUST 21, 1943 – MARCH 25, 2014

Jonathan’s contribution was unique. The Honorable Edward J. Markey, U. S. Senator for Massachusetts, has graciously provided the following remarks on his passing:

Jonathan Schell was a visionary leader in the fight against nuclear weapons. Through his writing, he changed profoundly the way millions of people viewed the toll the nuclear arms race would take on our nation and planet. His work to awaken public awareness of the perils of nuclear war helped catalyze our country to the threat of nuclear weapons. He dedicated his life to being an unmatched voice for peace and disarmament and will be greatly missed.

Forward Deployed Nuclear Weapons: A European Perspective

Paul Lansu

The end of the Cold War and the asymmetric geopolitics of the new post-9/11 environment have dramatically upset the strategic balance and called into question the role of military nuclear power in particular. The future of nuclear deterrence is once again trapped in the spotlight, and rightly so. The threat of proliferation, the issue of strategic surprise, or the resurgence of international tensions--as highlighted by the Ukrainian crisis--send divergent and dangerously ambiguous signals. Increasingly, in recent years, thought has been given to abandoning deterrence for doctrinal, ideologi-

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BOOK REVIEW

Action for Disarmament: 10 Things You Can Do

Published by the UN Department of Public Information, in cooperation with the UN Office for Disarmament Affairs, New York, NY 10017

(Credited primary authors Kathleen Sullivan and Peter Lucas)

ISBN: 978-92-1-142287-0

Available at UN HQ Bookshop in New York and UN Office Bookshop in Geneva, and at <https://unp.un.org/bookshop/details.aspx?sku=X3055>

The appearance of this volume embodies a series of deliberations and policy recommendations from the previous and current Secretaries-General, reflecting the finding that disarmament education had fallen behind contemporary realities: the persistence of enormous and perilous investment in armaments, the minimally productive outcomes of non-proliferation efforts, and the emergence of non-State actors, with such threats as nuclear smuggling. In particular, a 2002 report of the UN Expert Group on Disarmament and Non-Proliferation Education emphasized new educational methods, wider implementation of educational programmes, and “education *for* disarmament” as against education *about* disarmament.

Hence this practical guide—conceptual digest and recipes for civic action--directed at high school and college-age young people. At 152 pages, it aims to be comprehensive but not unwieldy. How well does it do its job? First, it is attractively packaged—colorful but not condescending to its intended readership, with lots of evocative photographs. The manual defines terms of art in a tight and deft manner. In two calm paragraphs, for example, it captures the realities of radiological weapons, so-called “dirty bombs”. The substantial threat of the international trade in light weapons (light only relative to artillery; called “crew-serviced weapons” in many militaries) is discussed with precision. A bit of conscientious study of this volume and a teenager could hold her own in debate on controlling this deadly commerce, and on many other critical topics.

Considering the title and organization of the volume, of course, the numbered list is a staple of popular journalism (“Six Sure-fire Methods for Whitening & Brightening Your Teeth”). Natural questions arise: is the list dispositive, are its items sensible, does its taxonomy withstand a test of logic? In this case, the “10 Things You Can Do” consist of Stay Informed, Start a Club, Facilitate a Discussion, Express Yourself, Host a Film Screening, Voice Your Concern, Create an Event, Sign Up, Plan a Presentation, and Reach Out.

At first glance, one could quibble. How are “Express Yourself” and “Voice Your Concern” not redundant, or one

the sub-species of the other? The authors, though, have a useful intention; “Express Yourself” provides stimulus to consider a range of creative methods, such as video, web design, blogging, pod-casting, good old-fashioned analog bulletin boards, and so on. On the other hand, “Voice Your Concern” guides the user toward the most skillful approaches to elected officials...brevity, accuracy, courtesy in written communications...and it provides sample letters on the Arms Trade Treaty (ATT) and Treaty on the Non-proliferation of Nuclear Weapons (NPT).

“Host a Film Screening” would seem to nest plausibly under “Create an Event”, but here again the authors draw a practical distinction, with the former laying out a game plan for a successful screening, with a strong list of films most likely to educate and provoke fruitful exchanges, whereas the latter offers a wide-ranging set of suggested events, such as a teach-in, a vigil, a concert, a march—each with its specialized requirements.

Overall, the book is very useful and unpretentiously authoritative. Future editions might consider a couple of adjustments. Folks born since 1990 or so have a “two-click” expectation...information lives on the Web and is often judged as much by accessibility as by soundness (insert aging boomer sigh here). Many sections of the work, but especially “Inform Yourself”, have rich listings of resources—organizations, on-line tools, websites. Contemporary practice dictates a web portal, twin to the book, where the users could access this content directly, without keyboarding a URL from the book, and navigating only from there. (And by the way, this reviewer notes the absence of this publication and its sponsoring NGO among the resources; we hope our current reinvigoration effort helps us make the cut next time...)

Among the framing artifacts in the manual’s early pages is an elegant and feeling-full statement from Muhammad Ali, *en face* with a poignant photo of a young woman in foreground, perhaps from the Horn of Africa region, with an all-too-typical AK-47-armed man in background. With a pang, one can’t help but wonder if Mr. Ali is an important icon to today’s young people, and if this was the best choice.

The work concludes with a three-page note to educators. We can imagine *Action for Disarmament: 10 Things You Can Do* galvanizing their efforts, and finding its way into the hands of adolescents and young adults under its own power. Around the world, more than 400,000 middle schools, secondary schools, community colleges, and universities sponsor Model United Nations annually, which provide an often self-expiring surge of excitement and focus around global issues; this manual offers the option to sustain and broaden that energy in an assortment of practical ways, and bring it to bear on disarmament. Highly recommended.

CRR

A Message from NGOCODPS President Bruce Knotts



Welcome, friends, to our new version of *Disarmament Times*, which now appears in this expanded print format, twice per year, with longer, in-depth features, and co-launches with its new web-based twin, *Disarmament Times e-NEWS*, covering the current flow of key

events. We intend to use both publications to educate and inspire efforts to effect global peace.

The past year has been a time of transition and growth for our committee. We have consolidated our offices and are in the process of rebuilding our membership, aiming to strengthen our presence in the NGO disarmament and peace community at the UN.

We hope you have noticed our revitalized program efforts, organized and chaired by NGOCODPS member and lawyer Guy Quinlan. With both our programs and publications, we are striving to connect the dots between nuclear weapons and their humanitarian and environmental impacts, and add a human face to technical or complex issues.

We would like to extend a heartfelt thank you to Melissa Gillis, who has departed after seven years of outstanding service as editor of the *Disarmament Times*. We will miss her, and wish her well in her new adventures.

We are very pleased to introduce our new editors. Charles Rosenberg, our new print edition editor, is a UN retiree who served in peacekeeping missions in Kosovo, Haiti, and Mozambique, and in the offices of the Under-Secretaries-General for Peacekeeping Operations and for Management, principally in management analysis and organizational communications. He maintains a parallel artistic existence as a published poet, literary translator, songwriter, and musician.

Elaine Riot, editor of *Disarmament Times E-News*, is a seasoned digital journalist and editor, with expertise in non-profit and corporate communications and a background in higher education administration. She volunteers as social media coordinator for Loretto at the UN, and also sustains an alternate identity as playwright, blogger and screenwriter.

We hope our new efforts will be of service to the UN community and beyond. We are proud to be furthering the work of the NGO Committee on Disarmament, Peace and Security, which celebrates its 36th anniversary this year.

In Peace,
Bruce Knotts

EDITOR'S NOTE

It is exciting to take the helm of *Disarmament Times*. Whether you are one of our long-time loyal readers, or a new friend whose loyalty we hope to earn, we need and invite your comments.

First, an inducement: an email to disarmeditor@gmail.com will garner you a free subscription to our bimonthly e-NEWS edition, enabling you to keep up with current activities and near-horizon, critical events, as well as getting an early peek at forthcoming print topics.

And since you'll already be at the keyboard, please drop me a note at chuckrrose2@gmail.com and let me know what you think about the new print format and content. What did you find most useful or compelling? What would you like to see covered in the future, in these longer-form pieces? Of the four articles in this issue, three are by first-time DT contributors. This reflects an effort to reach out and draw in new sources of knowledge and opinion, and create new networks of influence.

We have some intriguing themes to address in our fall/winter issue, along with our highly valued annual spreadsheet of UN member states' voting on all disarmament, peace and security measures. You are deeply devoted to a just & peaceful future for our world...our hope is to inform, educate, and inspire you as you go forward with your work of inquiry, advocacy, and action. It will be great to hear from you.

Charles Rosenberg, Editor

[continued from front page]

and Awe” of the Iraq invasion, there has been a fascination with, and an increasing reliance on, new technologies. But technology advances are not without issues. Napalm and nuclear weapons in WWII, thermonuclear weapons in the Cold War, Agent Orange in Vietnam, all presented ethical and moral questions. Ballistic missile defense technologies are truly amazing, but concerns exist over their destabilizing influence and their enormous cost, let alone their efficacy. Stealth fighters and amazingly accurate bombs and missiles made quick work of the first Gulf War, but many worried that those weapons reduced war to a “video-game,” “television” event. And, in the current era, worries about drones and surveillance technologies dominate public debate.

Since the end of WWII, the U.S. has been involved in a seemingly continuous series of police actions, insurgencies, or guerilla wars. Since the events of September 11, 2001, the U.S. and its allies have been involved in difficult conflicts in Iraq and Afghanistan, and a shadowy global war on terror. Fighting around the globe, in cities, tribal areas, and ungoverned regions is significantly different than an army facing an army, and it demands different weapons and technologies, let alone new tactics. For the better part of the last decade, investments skyrocketed in a host of ever-more advanced war-fighting technologies. Recent years have seen staggering advances in genetics, nanotechnology, information technology, biology and synthetic biology, cyber warfare, robotics, and numerous other technologies. The intersection of these has created opportunities for interesting and totally new type of weapons, available at low cost and readily available -- democratized weapons. And while the U.S. and its allies pursue new high-tech weapons, other countries and groups wish to follow that lead. With widespread access to these technologies, proliferation is a clear and present danger to be addressed.

The most well known, but not the only, worrisome recent advance has been the dramatic growth in the use of armed unmanned aerial vehicles (UAV) in combat. Human operators control current UAVs. Of concern is that aggressive programs of research and development are underway to provide those aerial systems and others with autonomous abilities, to include the application of lethal force. Military planners and decision makers assure us, that a human being will always be “in the loop” for the application of lethal force.

Two pertinent issues concerning drones, and autonomous weapons come to mind. The first is that if soldiers can fight a war from afar, without danger or fear, the barrier for violence may be lowered. The second is that it is unclear where responsibility for war crimes resides if an autonomous system makes a horrible mistake. Christopher Coker captures the concern well when he says “as soldiers become even more distant from their actions in an increasingly interactive relationship with machines, their role as moral agents will be hollowed out even more. Such traditional ideas as discrimination, proportionality, and justice in armed conflict actually presuppose that there are soldiers willing and able to act morally on the battlefield.” The introduction of autonomous lethal weapons portends a complex and ethically ambiguous arms race.

While we work at giving machines more human-like thinking abilities, we are working at giving humans more machine-like physical abilities. Enhancements such as implants, pharmaceuticals, and genetic modifications are in development, which will fundamentally alter the human body and dramatically enhance soldiers’ combat performance. From exoskeletons, to enhanced metabolic systems, to advanced physical and neural prosthetics, research is ongoing to improve dramatically soldier physical capabilities. Military applications of synthetic biology and genetic research are of great concern.

To be sure, most of the work is aimed at therapeutics for soldiers who have been injured in combat. Unfortunately, we know that we cannot always predict the trajectory of a certain technology, or estimate its long-term consequences for society. And, there are serious questions about safety, fairness, and even the impact on international arms control agreements. For instance, how would a soldier without fear, or one who could feel no pain, be considered under the Geneva Convention? And again, does the introduction of soldier enhancements on one side portend a new and different kind of arms race?

Consider also non-lethal weapons. One example is the Active Denial System, a microwave device intended for crowd control that will heat the surface of the skin, without permanent damage. Indeed, an important aspect of most non-lethal technologies is that they leave no lasting damage or evidence

of violence. Other non-lethal weapons include acoustic, laser, chemical, electric, and kinetic technologies. Non-lethal weapons, while largely an overwhelmingly positive development simply because they are non-lethal, also may (like unmanned vehicles) lower the threshold for the application of violence or become tools for repression by tyrants if not properly controlled. Moreover, as noted by Robert Mandel “non-lethal weaponry has the potential to decrease the inhibitions or negative incentives to initiate or perpetuate turmoil, as well as to reduce the positive incentives to end a conflict, by diminishing the horrors of war”. Finally, non-lethal weaponry could indirectly trigger a destabilizing new arena of international arms competition. If not stimulating a race to develop non-lethal weapons themselves, there could be a race to develop expensive countermeasures: “as the non-lethal arsenal expands, threatened states will be driven to acquire protective or counter-measures to strategic non-lethal technologies.”

Or consider cyber-warfare, on its surface nothing more than a fight between computers, but which in actuality can have disastrous effects on physical and financial infrastructure as well as enemy weapon systems. Debates continue about what constitutes an act of war in cyberspace, or whether a kinetic response to a cyber attack would be warranted, or whether preemptive cyber attacks are permitted under the laws of war, or about the deterrent value of cyber capabilities. These are unsettled questions, and international discussions are clearly warranted. While such a non-kinetic and, at least superficially non-lethal, option seems desirable, there are risks associated with accurate attribution and damage assessments as well as a need for measures to limit escalation once a cyber conflict begins.

There are a host of legitimate reasons given to pursue this broad menu of technologies for our military forces, among them a desire to reduce both combatant and non-combatant casualties and to gain a qualitative technological advantage. This is as it should be. We are expected to equip our military forces with the best possible weapons. For commanders to do otherwise would constitute a breach of trust with their soldiers. However, the employment of some of the more advanced technologies, and even the research, needs to be accompanied by careful thought about their ethical implications. *Absence of broad debate about the propriety and long-term consequences of some technology research suggests an area*

in great need of attention. [Italics Ed.]

Ignoring the ethical, legal, and societal implications of weapons technologies is a mistake. Attention to new considerations of Just War Theory, the Laws of Armed Conflict, and International Humanitarian Law demanded by new weapons is as important now as it has ever been.

In an intriguing analysis of the importance of diplomacy, Alan Misenheimer discusses lessons learned and explained in 400BC by Thucydides about the importance of a deep understanding of the motivations of fear, interest, and honor, in other countries and societies as a way of explaining their actions vis-à-vis our own. As the U.S. pushes forward with funding for research in these areas, and possible em citizenry must consider the effects of their actions on the behavior of others, and on the potential for these weapons to proliferate out of control, and take positive steps to understand and manage those effects.

Major General (Ret) Robert H. Latiff, Ph.D. , whose doctorate is in moral philosophy, is Adjunct Professor at the Reilly Center for Science, Technology, and Values at the University of Notre Dame. The University serves as annual host site for the International Society for Military Ethics.



The Biological Weapons Convention: Compliance, Transparency & Confidence

Filippa Lentzos

WHERE WE ARE NOW

Central to the compliance structure of the Biological and Toxin Weapons Convention (BWC) are the confidence-building measures – the means by which States Parties disclose information annually. Improving this process was one of the key substantive topics of the last Review Conference in 2011, and has been an agenda item during the past two years of the intersessional process. Despite this, many perceive that the measures are not relevant for States Parties' security needs and that, as currently constituted, they do not provide useful information. This article considers the underlying and evolving purpose of the confidence-building measures, and argues that a new, expanded understanding of what builds confidence is required.

BLURRED LINES AND THE NEED TO CONVEY INTENT

In early 2000, a series of secret projects were reportedly underway in the United States to improve biodefenses. The Pentagon was buying commercially available equipment to build a small-scale germ factory to produce anthrax simulants – *Bacillus thuringiensis*, the biopesticide made at the main Iraqi bioweapons center before it was blown up by United Nations inspectors in 1997. Another US project involved genetically modifying anthrax to make a vaccine-resistant superbug. Meanwhile the CIA, in one of its projects, was building Soviet-style bio-bomblets and testing them for dissemination characteristics and performance in different atmospheric conditions (Miller et al., 2001).

Pentagon and CIA lawyers said the projects were legitimate defensive activities: building and operating a bioweapons facility helped uncover the telltale clues of distinctive patterns of equipment buying; genetically modifying anthrax was essential to check whether the current vaccines administered to soldiers were effective; and building and testing bomblets was a defensive response to specific intelligence about a possible adversary. Others disagreed, saying the

projects were not permitted by the Biological and Toxin Weapons Convention (BWC), signed and ratified by the United States in 1975 (Miller et al., 2001).

The treaty permits almost any kind of research in the name of defense. Some of this work is unquestionably justifiable. Other research edges closer to the blurred line between defensive and offensive work. The trouble with distinguishing permitted biodefense projects from non-permitted projects is that it is not just about the facilities, equipment and activities, but also about the purpose or intent of those activities. An essential component in reaching a judgment of compliance with the treaty is therefore an analysis of justifications provided by states for the activities in question.

The US State Department has noted in its annual compliance report to Congress that both China and Russia are engaged in dual-use activities – such as identifying factors that enhance the virulence, toxicity, or antibiotic resistance of pathogens (including through the use of genetic engineering), synthetic production of toxins, and examining biological aerosols – but that available information does not indicate that the purpose of these activities were prohibited by the BWC (US Department of State, 2013). By keeping secret projects like building germ plants, creating superbugs, and testing germ bomblets, the United States undermines the treaty it helped to create and its own moral authority, because such activities, regardless of their legitimacy, will inevitably stir suspicion when they come to light. While there is defensive research that a nation might legitimately keep secret – such as experiments exploring the vulnerabilities of existing vaccines – the existence of such research and its general outlines should be disclosed whenever possible to allay fears and suspicions. After all, this is the main purpose of the confidence-building measures of the BWC.

THE CONFIDENCE-BUILDING MEASURES

The measures themselves are essentially an annual exchange of information between States Parties; such an exchange encourages states to be transparent about their biodefense programs and to provide justification for their activities.¹ The primary

1 The information exchange is based on a set of six measures, covering research centers and laboratories, biodefense programmes, outbreaks of infectious disease, past offensive

aim of the measures is to build trust between states that no activities are taking place in breach of the convention.

They emerged in the early 1980s following the crisis of confidence among states that resulted from unresolved allegations of non-compliance, rapid developments in science and technology, and other pressures. They were conceived, developed, and agreed to at a time when it seemed plausible that a verification mechanism was going to be put in place that resembled the declarations and on-site inspections of the Chemical Weapons Convention (CWC) then under negotiation. The measures were therefore not conceived of as a verification tool, but merely as a layer within a larger “regime of compliance” (Sims, 2001). While they demonstrate compliance, they do not guarantee it.

The emphasis on seeking verification between the end of the Cold War and the Fifth BWC Review Conference in 2001 led, however, to a lack of interest in developing the measures. Political differences since 2001 meant the confidence-building measures (CBMs) remained unmodified for another decade until they were modestly reviewed at the Seventh Review Conference in 2011.

At that Conference, BWC members agreed that the CBM regime has contributed to enhancing transparency and building confidence. In the interest of maximizing transparency, and disseminating the relevant information as widely as possible, many states are now making their CBM returns publicly available or are working towards doing so. Making these submissions public can greatly enhance their function. The knowledge, experience, and expertise of civil society can contribute to the communication process and to enhancing transparency between states in several ways, including through: assisting states to collect and collate information for the CBMs; monitoring states’ activities; collecting data from open sources; processing the data submitted to generate accessible information; and, ultimately, by bringing this information into the public sphere. Restricting access to CBM returns risks building suspicion rather than confidence among important stakeholders, and misses an opportunity to engage these same stakeholders in processes that might actually enhance the quality and completeness of the information submitted.

programmes, vaccine production facilities, etc.

To date, about a third (21/60) of the states that have submitted their 2014 CBMs have made them publicly available. These are: Australia, Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, Germany, Japan, Latvia, Lithuania, New Zealand, Portugal, Republic of Moldova, Romania, Slovenia, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

Despite these positive developments, and despite dedicated agenda items at the 2012 and 2013 intersessional meetings on increasing CBM submissions, participation in the regime is currently the lowest in nearly a decade. While there may be many mitigating factors preventing states from participating, one key factor is the perception that CBMs are not relevant for States Parties’ security needs and that, as currently constituted, CBMs do not provide useful information.

KNOWLEDGE-BASED RISKS AND THE NEED TO SET AN EXAMPLE

The underlying purpose of the CBMs, as noted above, has traditionally been seen to be about conveying intent and reducing the occurrence of ambiguities, doubts and suspicions. This underlying purpose remains essential to the health of the convention. However, to give effect to that traditional purpose in today’s political, security and scientific contexts requires a new, expanded understanding of what builds confidence. Confidence building in the biological field today must also be about setting appropriate examples for others to emulate.

Here’s why: The traditional “artefact-centric” approach to regulating unconventional weapons – which seeks to control the materials, methods and products involved in misuse – is becoming ever-more ill-suited to the life sciences, where the technologies are less about hardware, equipment and tools, and more about people, processes and know-how. Dual-use, or multi-use, life science technologies are increasingly diffuse, globalised, and multidisciplinary, and are often based on intangible information rather than on specialised materials and equipment. This changes the definition of the problem from a material- and equipment-based threat that can be eliminated to a knowledge-based risk that must be managed.

Risk-based regulation involves a plurality of public and private actors, instruments and purposes that can be grouped into three modes of governance: “hard law”, “soft law” and “informal law”:

1. “Hard-law” is based on the authority of the state and accompanied by penalties for noncompliance; it includes statutory regulations, reporting requirements, and mandatory licensing, certification, and registration.
2. “Soft-law” is less formal and based on conceptions of what is socially desirable; it includes professional self-governance, codes of practice, and guidelines.
3. “Informal law” involves the emulation of successful practices and models of behaviour; it includes national and international standards, education and awareness-raising.

All three modes of governance play important roles in influencing, identifying, and inhibiting those who seek to misuse the life sciences. Truly effective management of the knowledge-based risk posed by dual-use life science technologies must therefore couple hard-law with both soft-law and informal law. So in addition to national implementation of the BWC, it is important that governments support bottom-up codes of practice initiatives; education, outreach and awareness-raising initiatives; and so on. But, at the same time, governments also have to act as the ultimate role model. Governments have to look inward at themselves and demonstrate outward to others that their own house is in order. And this is where the CBMs of the BWC come in.

The process of collecting and submitting information for CBM submissions provides a mechanism for individual governments to draw domestic stakeholders together, to focus internal inter-agency or inter-departmental coordination, and to increase their awareness and oversight of relevant national biological activity.

Complete, accurate and annual CBM submissions demonstrate to peers in government and to peers in other governments that states have their house in order. And for the growing number of States Parties making their CBMs publicly available, they also demonstrate that they have their house in order to other

– equally significant – stakeholders in managing the risks that biology may be misused.

THE DISCUSSION CONTINUES...

Discussions about understanding of confidence-building, the purpose and future development of the CBM regime, and how it links into the larger discussion on compliance, will continue in the lead up to the Eighth Review Conference in 2016. CBMs are not on the formal agenda for the remainder of the current intersessional cycle, but individual states are encouraging, and funding, initiatives to enable the discussion to evolve. Up first are two August workshops in Geneva: one on ‘Confidence and compliance with the BWC’ jointly organized by King’s College London and the Geneva Centre for Security Policy, with funds from the United Kingdom Foreign & Commonwealth Office; the second on ‘Open source tools for the assessment of compliance with the BWC’ organized by the Research Group for Biological Arms Control in Hamburg, with funds from the German Ministry of Foreign Affairs. These workshops are closely followed by a larger, three-day conference at Wilton Park in the United Kingdom on ‘BWC compliance: assessment, demonstration and practice’, which will focus on whether specific effective strategies on compliance can be identified, drafted, agreed and implemented.

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Filippa Lentzos, Ph.D., is a Senior Research Fellow in the Department of Social Science, Health and Medicine at King’s College London. A sociologist focused on the intersection of political and security aspects of the life sciences, she has contributed to the Biological Weapons Convention meetings for the last ten years as a researcher, analyst, and consultant on both the treaty substance and the process of engagement among States Parties and stakeholders.

["Forward Deployed Nuclear Weapons..." continued from front page]

cal, strategic, and ethical, as well as budgetary, reasons.

Since the end of the Cold War and the enlargement of NATO, the B61 Tactical Nuclear Weapon (TNW) is militarily irrelevant. Most dual-capable aircraft cannot even reach targets outside NATO's territory. How can NATO "deter" with weapons that have no military use? These Cold War relics are generally agreed to serve no military purpose, and there were hopes that the Obama administration would remove them as a unilateral gesture, with the aim of inviting reciprocal action from Russia. So far this has not happened, and a strange enactment of the perilous Cold War nuclear stand-off has been allowed to continue.

Eight European nations have nuclear weapons on their territory: Belgium, France, Germany, Italy, the Netherlands, Turkey, the Russian Federation and the United Kingdom. With the exception of Russia, all of these States are NATO members, and share responsibility for the continued forward deployment of USA tactical (non-strategic) nuclear weapons. Of the five States hosting these forward deployed nuclear bombs, four are also members of the European Union; a March 2010 resolution by the European parliament calls these weapons an "anachronism". Meanwhile, EU statements for Non-Proliferation Treaty (NPT) conferences tend to focus on the nuclear disarmament steps that other countries should take.

The 5 European "host nations" are in the midst of selecting a new generation of fighter jets to replace current F16 or Tornado aircraft. To perform the nuclear task, the new aircraft would have to be dual capable, able to undertake both nuclear and conventional missions.

NATO States currently hosting nuclear weapons have a key role to play in broader disarmament and non-proliferation efforts. The continued stationing of nuclear weapons in non-nuclear weapons States, as well as the training of their military to use these weapons is in violation of Articles 1 and 2 of the NPT, which prohibit any transfer of nuclear weapons to non-nuclear weapon States. The USA is the only country continuing the practice of forward deploy-

ment in Europe. There is no legitimate justification for the continued deployment of these weapons. They must be repatriated, so that Belgium, Germany, Italy, the Netherlands, and Turkey can be in unquestioned compliance with all of their treaty obligations.

The obsolescent doctrine is that tactical or non-strategic nuclear weapons are "small" nuclear weapons regarded to be more "useable" in combat. During the Cold War, the USA stationed hundreds of these tactical nukes in Europe under the NATO nuclear umbrella sharing policy. These "small" bombs, in their various models and calibrations, have an explosive yield that ranges from 0.3 to 170 kilotons; to translate, at the high end of the range we are talking about a destructive power that is 14 times that of the Hiroshima bomb.

The United States now has approximately 1,100 non-strategic nuclear weapons, with a few hundred deployed adjacent to aircraft in Europe, and the remaining stored in the United States. Estimates vary, but experts believe Russia still has between 2,000 and 6,000 warheads for non-strategic nuclear weapons in its arsenal. These weapons are outside of the agreements between the United States and Russia on the limits for nuclear weapons inventory, or reduction and verification measures.

American and NATO aircraft regularly conduct nuclear strike exercises, in which they practice loading and delivering the weapons. These nuclear exercises include practicing "generation" of aircraft, during which the aircraft simulate taking off in strike formation accompanied by air-defense aircraft, and conduct a simulated strike at a bombing range.

Fortunately, there is discussion within NATO about changing the role of nuclear weapons in its security defense doctrines and strategy. A majority of NATO countries do not explicitly want to keep USA nuclear weapons in Europe. Germany, the Netherlands, Norway, and Poland have proposed a series of steps that NATO and Russia should take to increase transparency of USA and Russian non-strategic nuclear weapons. Belgium, the Czech Republic, Hungary, Iceland, Luxemburg, and Slovenia also supported the proposal.

Two obstacles stand in the way of removing the TNW. First, there is an East-West split in NATO. A number of Western European NATO

countries see little use for continued deployment, while some Central and Eastern European countries regard the physical presence of USA TNW as a hedge against potential future Russian aggression.

The second obstacle is the assumption that the USA TNW can be used as bargaining chip in bilateral negotiations with Russia, with the aim to commit Russia to reductions of its own much larger stockpile of TNW. However, since Russia has at least 10 times more TNW, it is difficult to see how negotiations could proceed without the USA and NATO having to put other items on the bargaining table, such as missile defense and conventional weapons, which they are extremely unlikely to do.

Nuclear Disarmament for Development

An urgent aspect is the human and financial cost of maintaining – and even renovating – the U.S. stockpile of nuclear weapons. The USA is poised to spend \$11.6 billion to upgrade a handful of nuclear bombs. The Pentagon wants to upgrade the TNW in Europe, making them more accurate and more usable. There is growing opinion among political leaders and the general public – not least in Germany, the Netherlands, and Belgium – to get rid of these weapons. A small minority of NATO allies cling to the bombs as a political symbol of America's commitment to the security in Europe.

These maintenance and upgrade funds would be better used for the impoverished of the world, including those within the USA itself. The continued investment in weapons of mass destruction is not only intrinsically immoral, but also an immense violation of the dignity of those who are forced to live on the margins of our world. On behalf of the poor and excluded in society, all plans to refurbish nuclear arsenals, and policies that undermine efforts to eliminate nuclear weapons from the face of the earth, should be abandoned.

The doctrine of nuclear deterrence is itself the chief obstacle to meaningful progress on nuclear disarmament. It is what drives the modernization of existing stocks of nuclear systems, thus preventing genuine nuclear disarmament. All nuclear-armed States are in the process of modernizing their arsenals. Even debating modernization undermines the credibility of their commitment to the NPT, and especially the disarmament obligations under Article VI. This was explicitly recognized by a group of non-nuclear weapons States

in a working paper presented to the 2009 NPT Preparatory Committee meeting, in which they stated that “the development of new types of nuclear weapons... and the lack of significant progress in diminishing the role of nuclear weapons in security policies undermine disarmament commitments and work counter to the letter and spirit, of the Treaty.” The nuclear weapons States are currently allocating more than one trillion dollars for modernization expenses over the next decade; how can they be credible when they call for strengthening of the non-proliferation aims of the NPT?

Let us consider, in the light of these intended expenditures, that nearly 1.5 billion people in developing countries live in extreme poverty, living on less than \$1.25 a day. Every day, almost 16,000 children die from hunger-related causes. In the United States itself, 14.5 percent of households struggle to put food on the table.

It must be clearly understood: Tactical Nuclear Weapons (TNW) have no conceivable military function anymore. Rather, the debate about whether or not the TNW can be withdrawn is a political one. There is growing public opinion in Europe urging the USA not to renew its tactical weapons capacity.

Let's take the Belgian case: for 50 years there have been nuclear weapons sited in Belgium, at the 1100-acre Kleine Brogel Air Base, to the extreme northeast of the country, near the Dutch border. These weapons are useless, expensive and dangerous. The majority of the Belgian population wants them out. The government committed itself to work on a world without nuclear weapons, but tangible progress remains is absent.

Public support for removal is broad and deep. Over a hundred key leaders from the academic, cultural, political, trade union and socio-cultural sectors support the demand for the removal of nuclear weapons from Kleine Brogel. Along with the group of former Belgian prime ministers and the former NATO Secretary General, they are concerned about the lack of policies that might lead to a world without nuclear weapons.

In its governmental agreement of 2011 the Belgian leadership promised “to promote and support international initiatives for disarmament,

including nuclear disarmament". To this day this intention has not been fulfilled. In Belgium, the new government should begin local concrete measures, starting with the removal of the estimated 22 American B-61 bombs (tactical nuclear weapons) and their maintenance unit that are currently stationed in Kleine Brogel.

In the light of these circumstances, Pax Christi International recommends the following:

1. that European States recognize their non-proliferation responsibilities and take transparent, irreversible, and verifiable action to remove nuclear weapons from the continent. Where the EU is unable to speak with one voice, individual member States should express their view and uphold their non-proliferation obligations by insisting that USA/NATO nuclear weapons be removed from European soil.
2. that NATO nuclear host countries seize the opportunity of the NPT Preparatory Committee meeting to announce their intention to comply with all of their NPT obligations through efforts to terminate the NATO practice of nuclear "burden-sharing."
3. that nuclear-armed States declare a commitment to not modernizing their weapons and delivery systems, and that these declarations should be supported and encouraged by States involved in nuclear sharing or umbrella agreements.

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From Way Up Here

From way up here
The earth seems very small
It's just a little ball
Of rock and sea and sand:
No bigger than my hand

From way up here
The earth seems very small
They shouldn't fight at all, down there...
Upon that little sphere.

Their time is short
A life is just a day
You'd think they'd find a way
You'd think they'd get along
And fill their sunlit days with song.

From way up here
The earth is just a ball
A precious little ball, so small
So beautiful and dear...

Pete Seeger
From *God Bless the Grass* (1982)



Climate change security risks

Kristie L. Ebi

Multiple contributing and interacting factors determine human security in any location and any one time.¹ Weather and climate can interact with the wide range of factors characterizing current development to create security risks, whether subnational conflicts, threats to state stability, or major humanitarian disasters.^{1,2} Changing weather patterns with climate change, particularly changes in the frequency, intensity, and duration of some extreme weather and climate events, are anticipated to accelerate over coming decades regardless of the extent to which greenhouse gas emissions are reduced.³ Droughts, floods, and storms can disrupt societies that are not well prepared or unable to respond effectively. Further, extreme events are occurring not just singly but also jointly, sequentially, and/or with surprising intensity or duration, with less time for recovery. These events can stress communities, societies, governments, and the globally integrated systems that support human and natural systems.² In addition, sea level rise and associated nonlinear increases in storm surges are likely to be problematic for many coastal areas and small island states.

Several recent reports assessed understanding of how climate change could alter current security risks, including the US National Research Council report on Climate and Social Stress: Implications for Security Analysis,² and the Human Security chapter in the Working Group II (Impacts, Adaptation, and Vulnerability) contribution to the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report.¹ The National Research Council evaluated the evidence on climate-security connections over the coming decade. The IPCC chapter assessed the security risks that climate change poses to individual and communities, including threats to livelihoods, culture, and political stability over shorter and longer time scales.

The reports used a similar framework for evaluating risks, where the overall risk to a society from a weather or climate event is determined by the interactions of several factors: the severity of the event; the extent of exposure of valued human and natural systems; the susceptibility of individuals and communities to harm from the event; and the effectiveness of their ability to prepare for, cope with, respond to, and recover from the event.⁴ Extreme events are not necessary to create an extreme impact; a

disaster can result when a less than extreme event affects a region with very high vulnerability.³ Conversely, an extreme event in a well-prepared region may not result in an extreme impact. Major social and political disruption can occur when exposure and susceptibility are sufficiently great and preparation and response are inadequate. Climate change is a threat multiplier in that it interacts with, and can exacerbate, underlying vulnerability.

Climate change is an important contributor to human security threats through undermining livelihoods; compromising culture and identity; increasing migration that people would have rather avoided; and challenging the ability of states to provide the conditions necessary for human security and well-being.¹ As events become more frequent and, potentially, more severe, sequences or cascades of events could precipitate unexpected physical or biological consequences, including shocks to globally connected systems, such as food markets, strategic commodity supply chains, and public health. Adger et al. concluded that *climate change will lead to new challenges to states and will increasingly shape both conditions of security and national security policies.*¹

The main areas of concern for human security are (1) access to sufficient quantities of nutritious food, safe water, and energy resources; and/or (2) changing demands for humanitarian assistance and disaster relief. The first can affect economic and political stability, and the second carries the threat of large-scale environmental refugees and displacement. These areas can interact, such as in the Dust Bowl in the US in the 1930s. Significant impacts on human health, economic hardship, and extensive mass migration resulted from a multi-year drought combined with soil erosion, loss of forage for grazing, inefficient use of water, highly variable farm incomes, and high level of indebtedness.⁵

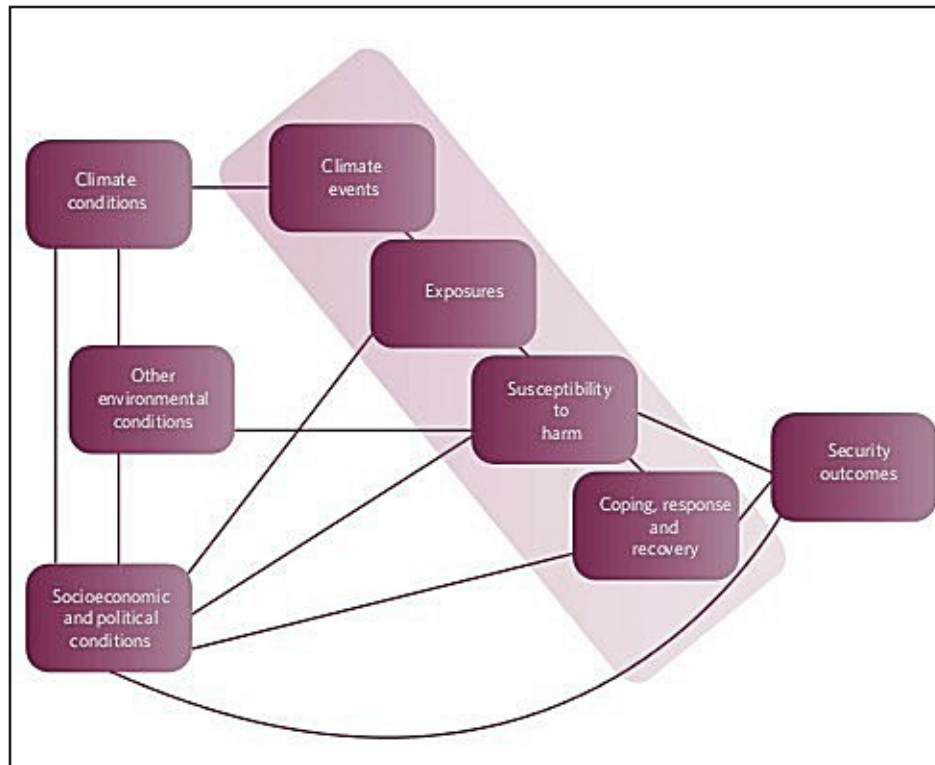
Extreme weather and climate events can have profound societal consequences through changes in resource availability and ecosystem services. As demand for resources increase over coming decades, security concerns are expected to arise from the tight interconnectedness of water, food, and energy. By 2030, population growth and a growing middle class are projected to increase the worldwide demand for food by 35% and for energy by 50%.⁶ At the same time, climate change is projected to affect the availability of sufficient quantities of nutritious food and safe water, particularly in regions already facing challenges.⁷ Together, these factors will further stress resources,

constrain development, and increase competition in ways that could increase security concerns.

Research is determining under what conditions climate change could enhance security risks. For example, a recent analysis built a composite vulnerability model to identify hot spots of climate insecurity in Africa, where large numbers of people could be at risk of death from climate-related hazards.⁸ The four processes assumed to contribute to vulnerability were physical exposure, population density, household and community resilience, and governance and political violence. Regional climate model simulations focused on the occurrence of dry days, heatwaves, and heavy rainfall days, coupled with low-lying coastal elevation. For the late 20th century, a mapping process indicated the most vulnerable areas were concentrated in Chad, the Democratic Republic of the Congo, Niger, Somalia, Sudan, and South Sudan. For the mid 21st century, the projections suggested more extensive vulnerability throughout the Sahel, including Burkina Faso, Chad, Mali, northern Nigeria, Niger, across Sudan, and western Ethiopia. Heatwave days and heavy precipitation days in coastal areas are projected to worsen vulnerability throughout West Africa. Dry days and heatwaves are projected to affect vulnerability in Malawi, Mozambique, and Zimbabwe, while DRC is projected to become less vulnerable because of a reduction in dry days and heavy precipitation days.

There is increasing interest in understanding the extent to which climate change could affect migration and increase the risk of violent conflict.¹ While there is a high degree of uncertainty, changes in the incidence of extreme events will amplify the challenges and risks of migration, although some vulnerable groups may not have the resources to migrate to avoid

the impacts of floods, storms and droughts. Migrants themselves may be vulnerable to climate change impacts in destination areas, particularly in urban centers in developing countries. Some factors that increase the risk of violent conflict within states are sensitive to climate change; however, the effects of climate variability and change on violence are contested.¹ Although there is little agreement about direct causality, violence is associated with low per capita incomes, economic contraction, and inconsistent state institutions, and these factors can be sensitive to climate variability and change. Further, large-scale violent conflict can negatively impact infrastructure, institutions, natural and social capital, and livelihood opportunities, making people and communities in these regions particularly vulnerable to climate change. [The chart here shows a schematic model of links between climate events



and outcomes of security concern. Reprinted by permission from Macmillan Publishers Ltd: National Academies report, (c) 2012.]

Even though the links between climate events and security outcomes are complex, contingent, and not well enough understood to allow for robust projections, it is also prudent to anticipate that security risks will become more common in a

changing climate.^{2,4} Preparing for such risks requires not just projections of the magnitude and pattern of climate change, but also scenarios of how future social, political, and economic conditions could make communities and regions more or less vulnerable when risks materialize. Critical needs include improving understanding of the conditions under which climate-related disasters and disruptions of critical systems could lead to important security-relevant outcomes; new and finer-grained indicators that integrate quantitative measurements with qualitative assessments of potential security risks; and proactive efforts to anticipate threats,

particularly those that could disrupt vital supply chains and contribute to large-scale shocks.

A key recommendation from the NRC report was to conduct periodic “stress testing” of the ability of countries, regions, and critical global systems to manage potentially disruptive climate events.^{2,4} The process could be used to target efforts to reduce vulnerability and to improve coping, response, and recovery capacities. Methods that could be employed include the qualitative interpretation of available knowledge, formal modeling, and interactive gaming approaches. Techniques should integrate knowledge and expertise from physical and social sciences, accumulating data on social, political, and security consequences of disruptive events to improve future analyses.

The risk of future threats to security can be reduced through anticipatory and iterative risk management, informed by monitoring of climate variability and change, of evolving vulnerabilities of communities and nations, and of the effectiveness of organizations and institutions to prepare for, cope with, respond to, and recover from events. It is more important than ever to start now.

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Pictures from a Hiroshima Schoolyard: A Remarkable Story Captured in a Stirring Film

In 1995, a parishioner of All Souls Unitarian Church in Washington, D.C. uncovered an anomalous box in his home. In the box were 48 colorful drawings made by children as thanks for gifts received from the church almost fifty years earlier. As you see here, the cheerful drawings show scenes of beauty and joy from a schoolchild’s perspective. None of the pictures reflect the horror that these children had endured less than two years earlier when a bomb, like no other before it, was dropped and detonated above their homes in the city of Hiroshima, Japan. From among their original classmates at Honakawa Elementary School, only one survived.

How did these pictures come about? At the time of the Pacific war’s ending with the two bombs dropped on Nagasaki and Hiroshima, the Pastor of All Souls Church, the Reverend A. Powell Davies, while fully aware of the blessings of a long-awaited peace, still was horrified by the nature and magnitude of this new weapon. Worse, a year later, August 1946,



and members of All Souls Church hung them on the very walls of the building in which they were created. In the words of the award-winning filmmakers, American director Bryan Reichardt and Japanese producer & dance theatre director Shizumi Shigeto Manale, this renewed exchange and its documentation allow the drawings “to radiate their message of peace and hope to the world.”

The film is called *Pictures from a Hiroshima Schoolyard*. For information about your organization screening this film, please check the screening application at www.hiroshimaschoolyard.com/seethefilm/ And, for our New York City based friends, watch future issues of our digital counterpart, *Disarmament Times e-NEWS*, for information about a possible screening by our committee in fall 2014.

he saw newspaper photographs of the devastation that still haunted the living and learning conditions of Hiroshima’s schoolchildren, and expressed his indignation publicly.

This was reported nationally, and made its way to the ears of General MacArthur’s civilian occupation staff in Japan. A staff member, Howard Bell, wrote to Reverend Davies and provided a conduit for assistance; and so Davies led his congregation in collecting school supplies for the children who had gone back to Honakawa Elementary School and were in such wretched circumstances. Around Christmas of 1947, the church sent a ton of school supplies and other gifts to the children.

By way of thanks, the children sent a collection of the drawings you see here, summoning memories of past happiness and expressing their hope for the future. On initial receipt in 1948, the pictures were celebrated and cherished, but in time they fell into obscurity and were moved to a vault. For several decades, they were brought out only upon visits to the church by atomic attack survivors (*hibakusha*).

As the drawings were rediscovered, they became the basis of a wonderful project: to share them with the wider world via a documentary film that focuses on reuniting the pictures with their original artists, now 70-year-olds in Japan who were amazed and delighted to see them again. In 2010, those artists

