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APPLICATION OF THE OPCW MECHANISMS FOR REVIEWING  
AND ADDRESSING SCIENCE AND TECHNOLOGY  
DEVELOPMENTS: THE CASE OF INCAPACITATING CHEMICAL  
AGENTS (ICAs)

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POLICY PAPER 1  
BIOCHEMICAL SECURITY 2030 PROJECT

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**DR MICHAEL CROWLEY**

Project Coordinator of the Bradford Non-Lethal Weapons Research  
Project based at the Peace Studies Department, School of Social  
and International Studies, University of Bradford, United Kingdom.

Email: [m.j.a.crowley@bradford.ac.uk](mailto:m.j.a.crowley@bradford.ac.uk)

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Brett Edwards, *Research Officer (Series Editor)*

Prof. David Galbreath, *Principal Investigator*

Biochemical Security 2030 Project, Department of Politics, Languages and International Studies, University of Bath, United Kingdom.

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## EXECUTIVE SUMMARY

The Chemical Weapons Convention (CWC) is a multilateral treaty that prohibits the development, production, stockpiling, transfer and use of chemical weapons “*under any circumstances*” and requires their destruction within a specified period of time. In order to fulfil its primary objectives to permanently eradicate existing chemical weapons and to prevent the development and proliferation of further chemical weapons, the Organisation for the Prohibition of Chemical Weapons (OPCW) must firstly ensure effective monitoring and assessment of advances in those scientific and technological disciplines of relevance to the Convention. Secondly, the information gained from such activities needs to inform the development of appropriate policy and practice to meet the challenges and utilise the opportunities arising from such developments. This study analyses how this two-step process has been applied by the Organisation in the case of incapacitating chemical agents (ICAs).

The CWC through its General Purpose Criterion has an extremely wide scope of coverage, and if applied correctly by its States Parties, ensures that all existing toxic chemicals and also all those yet to be discovered or developed are covered within its ambit. Consequently, it is clear that, as toxic chemicals, all potential candidate ICAs including pharmaceutical chemicals, bio-regulators and toxins, would be covered under the scope of the Convention. Furthermore, development, stockpiling, transfer or utilisation of such agents would be permissible only for purposes “not prohibited”, and only where the “types and quantities” of such toxic chemicals were consistent with such purposes. The use in armed conflict of toxic chemicals promoted as ICAs is clearly prohibited under the CWC. Whilst riot control agents can be legitimately used in law enforcement, there are differing interpretations as to whether, and in what circumstances, other toxic chemicals could be employed for such purposes.

Analysis of open source information from the mid-1990s onwards indicates that a number of States appear to have conducted research relating to ICAs and/or possible means of delivery at some stage during this period and there has been one large scale deployment of such agents by the Russian Federation in a counter-terrorist operation in 2002. The potential implications of the application of the rapidly evolving life and chemical sciences and associated technologies to the development of ICAs and associated means of delivery have been explored by a range of highly respected national and international scientific organisations including the UK Royal Society, the US National Academy of Sciences, Switzerland's Spiez Laboratory, and the International Union of Pure and Applied Chemistry, and the findings of such bodies have been brought to the attention of the OPCW.

It is clear from the current study, that those OPCW entities - namely the Scientific Advisory Board (SAB), the Director General and the Technical Secretariat - required to inform and/or render “*specialized advice in areas of science and technology relevant to the Convention*” to the policy making organs (PMOs), have undertaken careful review and analysis of the information available concerning ICAs and developments in associated science and technology, and have reported their findings to the relevant PMOs, including three successive Review Conferences.

In its report to the Third Review Conference, the SAB detailed developments in science and technology relevant to the Convention in this area stating that “*the technical discussion on the potential use of toxic chemicals for law enforcement purposes has been exhaustive.*” The SAB stated that ICAs should not be considered as “non-lethal” weapons and highlighted the extreme limitations in operational employment of ICAs for law enforcement. It also recommended that the

Organisation “*start preparations for verification activities, relevant to incapacitating chemicals, that could be required in an investigation of alleged use (IAU).*” These findings were supported by the Director General who formally committed the Technical Secretariat to begin preparations for verification of ICAs. The Director General also committed the Technical Secretariat to develop its capabilities to undertake technology monitoring and horizon-scanning more broadly.

Whilst the SAB, Technical Secretariat and the Director General have provided timely objective expert analysis of science and technology developments of relevance to incapacitating chemical agents and related means of delivery, the States Parties through the PMOs have been unwilling or unable to effectively review such information and adequately discuss the application of the Convention in this area. Consequently, they have failed to agree appropriate policy and practice for the Organisation to meet the challenges raised by ICAs.

Although the Third Review Conference failed to establish a mechanism to facilitate discussion amongst States Parties regarding ICAs, there does appear to be widespread support for this initiative within the Organisation, and it is hoped that the modalities of such a mechanism can be agreed by States Parties through a relevant PMO in the near future, if sufficient States continue to champion the issue.

The international community’s response to advances in weapons-related science and technology has often been inadequate and late, introducing partial and ineffective controls (if any are introduced at all) long after a new weapons technology has spread to and been employed by State and non-State actors. With the issue of ICAs - because proliferation has been relatively limited - there is still time to act. There is now an opportunity for the OPCW to take a precautionary and preventative approach, and address the development and use of ICAs and related means of delivery. If the OPCW does not do so in the near future there is a danger that advances in relevant scientific disciplines together with current and potential future State research and development into ICAs and related means of delivery may lead to proliferation and misuse of such weapons.

Given such concerns, CWC States Parties both individually and collectively should consider the following activities and processes for addressing the regulation of ICAs and their means of delivery:

- (a) Affirm current national practice is to restrict use of toxic chemicals for law enforcement to riot control agents, and reaffirm the existing prohibition on the use of toxic properties of all chemicals in armed conflict
- (b) Introduce national moratoria on the development, stockpiling, transfer and use of ICAs and related means of delivery intended for law enforcement purposes
- (c) Initiate a mechanism within the OPCW to discuss the employment of ICAs in law enforcement
- (d) Utilize existing CWC consultation, investigation and fact-finding mechanisms when activities of potential concern are reported
- (e) Utilise the Biological and Toxin Weapons Convention (BTWC) inter-sessional processes to explore science and technology developments of relevance to ICAs and related means of delivery.

In addition, the Director General and the Technical Secretariat should:

- (a) Develop appropriate verification mechanisms applicable to ICAs and their means of delivery
- (b) Monitor developments in science and technology applicable to ICAs and their means of

delivery

- (c) Explore the implications of convergence in the life and chemical sciences for the development of ICAs and related means of delivery.

Finally, it is important that the non-governmental scientific community continue to be actively engaged on this issue, and specifically should:

- (a) Monitor developments in science and technology related to ICAs and their means of delivery and highlight attempts to harness such developments in weapons programmes
- (b) Engage with the OPCW, the BTWC States Parties and BTWC Implementation Support Unit (ISU) to develop and promote possible science-informed policy responses
- (c) Conduct education and awareness-raising amongst the life and chemical science communities on these issues.

## 1. INTRODUCTION

The Chemical Weapons Convention (CWC)<sup>1</sup> is a multilateral treaty that prohibits the development, production, stockpiling, transfer and use of chemical weapons “*under any circumstances*”<sup>2</sup> and requires their destruction within a specified period of time. The treaty is of unlimited duration and is designed to be far more comprehensive in its application than any prior international agreement on chemical weapons. It is overseen by its own treaty body, the Organisation for the Prohibition of Chemical Weapons (OPCW).<sup>3</sup>

The Chemical Weapons Convention through its General Purpose Criterion has an extremely wide scope of coverage, and if applied correctly by its States Parties, ensures that all existing toxic chemicals and also all those yet to be discovered or developed are encompassed within its ambit. The Convention also establishes the structures, mechanisms and decision-making procedures of the OPCW, including those reviewing and addressing science and technological developments of relevance to the Convention – principally the Technical Secretariat (TS), the Scientific Advisory Board (SAB) and the Conference of States Parties (CSP).

This paper will explore how the existing OPCW mechanisms for reviewing and addressing advances in relevant science and technology<sup>4</sup> have responded to the challenges raised by the development and utilisation of weapons employing incapacitating chemical agents (ICAs).

## 2. INCAPACITATING CHEMICAL AGENTS

Although certain States and pluri-lateral organizations such as the North Atlantic Treaty Organization (NATO) have sought to characterize incapacitating chemical agents (ICAs),<sup>5</sup> there is currently no internationally accepted definition for these chemical agents. Indeed certain leading scientific experts and international organisations believe that such a technical definition is not possible.<sup>6</sup> Whilst recognising the contested nature of this discourse, the 2012 Royal Society definition will be employed as a provisional working description in this paper, and ICAs will be considered as: substances intended to cause prolonged but transient disability and include centrally acting agents producing loss of consciousness, sedation, hallucination, incoherence, paralysis, disorientation or other such effects.<sup>7</sup> Candidate agents may often possess a very low safety margin

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1 OPCW, Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (Chemical Weapons Convention), 1993, <http://www.opcw.org/chemicalweapons-convention/articles> (accessed 21<sup>st</sup> October 2013).

2 Chemical Weapons Convention (1993) *op.cit.* Article 1.

3 For further discussion of the OPCW see the Organisation’s website <http://www.opcw.org/> (accessed 21<sup>st</sup> October 2013).

4 A policy paper by the author analysing the OPCW mechanisms for reviewing and addressing science and technological developments relevant to the implementation of the CWC, and their operation prior to and during the Third Review Conference, will be published shortly as part of the Biochemical 2030 Project.

5 See: NATO Glossary of Terms and Definitions (English and French), NATO document AAP-6(2012), 2012, p. 2-I-2.

6 A report of an expert meeting organized by Spiez Laboratory concluded that: “...because there is no clear-cut line between (non-lethal) ICA [incapacitating chemical agents] and more lethal chemical war-fare agents, a scientifically meaningful definition cannot easily be made. One can describe several toxicological effects that could be used to ‘incapacitate’, but in principle there is no way to draw a line between ICAs and lethal agents”. See Spiez Laboratory, *Technical Workshop on Incapacitating Chemical Agents, Spiez, Switzerland*, 8–9 September 2011, 2012, p. 10; See also: International Committee of the Red Cross, *Toxic Chemicals as Weapons for Law Enforcement: A threat to life and international law?*, Synthesis paper, ICRC, September 2012, pp.1-2.

7 See: The Royal Society, *Brain Waves Module 3: Neuroscience, conflict and security*, RS Policy document 06/11, February 2012, pp.44-45; See also: The Royal Society, *The Chemical Weapons Convention and*

(the difference between desirable and undesirable effects), so the effects of ICAs are in fact variable and can include death.<sup>8</sup> ICAs are distinct from riot control agents (RCAs), which are locally acting chemicals that produce rapid sensory irritation of the eyes, mucus membranes and skin, whose effects disappear shortly after termination of exposure.

A wide variety of toxic chemicals could potentially be employed as ICAs, including: anaesthetic agents, skeletal muscle relaxants, opioid analgesics, anxiolytics, antipsychotics, antidepressants and sedative-hypnotic agents,<sup>9</sup> many of which are currently legitimately used by the medical or veterinary professions.<sup>10</sup> As well as such pharmaceutical chemicals, candidate ICAs for weaponisation could include bioregulators and toxins (see figure 1). All three of these chemical classes are covered under the Chemical Weapons Convention (CWC). In addition, bioregulators and toxins would also fall within the scope of the Biological and Toxin Weapons Convention (BTWC).

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*convergent trends in science and technology*: RS Seminar held at the OPCW, 18<sup>th</sup> February 2013, [https://royalsociety.org/uploadedFiles/Royal\\_Society\\_Content/policy/projects/brain-waves/2013-08-04-Chemical-Weapons-Convention-and-convergent-trends.pdf](https://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/projects/brain-waves/2013-08-04-Chemical-Weapons-Convention-and-convergent-trends.pdf) (accessed 21<sup>st</sup> October 2013), p.2; For an alternative definition see: Pearson, A., Chevrier, M. and Wheelis, M. (eds), *Incapacitating Biochemical Weapons*, 2007, p. xii.

8 The Royal Society (February 2012) *op.cit.*, p.44, and The Royal Society (18<sup>th</sup> February 2013) *op.cit.*, p.2.

9 See for example: Lakoski, J., Murray, W., and Kenny, J. The advantages and limitations of calmatives for use as a non-lethal technique, College of Medicine Applied Research Laboratory, Pennsylvania State University, 3<sup>rd</sup> October 2000; for further discussion see: The Royal Society (February 2012) *op.cit.*, pp.46-50.

10 Aas, P. The Threat of Mid-Spectrum Chemical Warfare Agents, *Pre-hospital and Disaster Medicine*, volume 18, number 4, 2003, p. 309; The Royal Society (February 2012) *op.cit.*, pp.46-50.

**Figure 1: (Bio)chemical threat spectrum chart<sup>11</sup>**

Classical chemical weapons	Industrial pharmaceutical chemicals	Bioregulators Peptides	Toxins	Genetically modified biological weapons	Traditional biological weapons
Cyanide Phosgene Mustard Nerve Agents	Fentanyl Carfentanil Remifentanil Etorphine Dexmedetomidine Midazolam	Substance P Neurokinin A	Staphylococcal enterotoxin B (SEB)	Modified/tailored bacteria and viruses	Bacteria Viruses Rickettsia  Anthrax Plague Tularemia
Chemical Weapons Convention (CWC)					
	Poisons				
		Biological and Toxin Weapons Convention (BTWC)			
				Infectious agents	

There is a long history, dating from the late 1940s onwards, of certain State programmes attempting to develop ICA weapons principally employing a range of pharmaceutical chemicals but also certain toxins.<sup>12</sup> Analysis of open source information from the mid-1990s onwards indicates that a number of States including China<sup>13</sup>, the Czech Republic<sup>14</sup>, Israel<sup>15</sup>, Russia<sup>16</sup>, and the United States<sup>17</sup>

- 11 Adapted from: Pearson, G., 2002, 'Relevant Scientific and Technological Developments for the First CWC Review Conference: The BTWC Review Conference Experience', *CWC Review Conference Paper no.1*, University of Bradford, p.5.
- 12 States that reportedly conducted research into ICAs or acquired such agents at some stage prior to 1990 included: Albania, Iraq, Israel, (Apartheid) South Africa, the Soviet Union, the United Kingdom, the United States and Yugoslavia. See: The Royal Society (February 2012) *op.cit.*, pp.10 and 12; Perry Robinson, J., Incapacitating chemical agents in context: an historical overview of States' policy, pp.89-96 in: International Committee of the Red Cross (ICRC), *Expert meeting, "Incapacitating chemical agents": Law enforcement, human rights law and policy perspectives Montreux, Switzerland, 24th to 26th April 2012*; Crowley, M. *Dangerous Ambiguities: regulation of riot control agents and incapacitants under the Chemical Weapons Convention*, 2009; Dando, M. and Furmanski, M. Midspectrum Incapacitant Programs, in Wheelis, M., Rózsa, L. and Dando, M. (eds), *Deadly Cultures: Biological Weapons Since 1945*, 2006; Davison, N. *Non-lethal weapons*, 2009; Perry Robinson, J. Bringing the CBW Conventions closer together, *CBW Conventions Bulletin*, issue 80, September 2008, pp.1-3.; Furmanski, M. Historical military interest in low-lethality biochemical agents, in Pearson, A., Chevrier, M. and Wheelis, M. (eds), *Incapacitating Biochemical Weapons*, 2007; Pearson, A. Incapacitating Biochemical Weapons: Science, Technology, and Policy for the 21st Century, *Nonproliferation Review*, volume 13, number 2, 2006; Guillemin, J. *Biological Weapons: From the Invention of State-sponsored Programs to Contemporary Bioterrorism*, Columbia University Press, 2005, pp. 122–27.
- 13 Crowley, M. (2009) *op.cit.*, p.82; Guo Ji-Wei and Xue-sen Yang, 'Ultramicro, Nonlethal and Reversible: Looking Ahead to Military Biotechnology', *Military Review*, July-August 2005, as cited in Pearson, A. 'Late and Post-Cold War Research and Development of Incapacitating Biochemical Weapons', in Pearson, A. Chevrier M. & Wheelis M. (2007) *op.cit.*
- 14 Crowley, M. (2009) *op.cit.*, pp.79-80; Hess, L., Schreiberová, J., Málek, J., Fusek, J., 2007, 'Drug-Induced Loss of Aggressiveness in the Macaque Rhesus', *Proceedings of 4<sup>th</sup> European Symposium on Non-Lethal Weapons*, 21<sup>st</sup>-23<sup>rd</sup> May 2007, Ettlingen, Germany, European Working Group on Non-Lethal Weapons, Pfinztal: Fraunhofer ICT, V15; Hess, L., Schreiberova, J., and Fusek, J., 2005, 'Pharmacological Non-Lethal Weapons', *Proceedings of the 3<sup>rd</sup> European Symposium on Non-Lethal Weapons*, 10<sup>th</sup> -12<sup>th</sup> May 2005, Ettlingen, Germany, European Working Group on Non-Lethal Weapons, Pfinztal: Fraunhofer ICT, V23;

appear to have conducted research relating to ICAs and/or possible means of delivery at some stage during this period. In 2008, the International Union of Pure and Applied Chemistry (IUPAC) noted that:

*“Many of the chemicals that are being synthesized and screened as part of the drug discovery efforts... will have incapacitating properties that could make them suitable as so-called “nonlethal” agents... Efforts are reportedly underway in some States Parties to develop weapons with nonlethal properties for use in law enforcement situations. But such weapons may also be thought to have utility in counter-terrorism or urban warfare situations.”*<sup>18</sup>

In 2010 the International Committee of the Red Cross (ICRC) stated that *“There is clearly an ongoing attraction to ‘incapacitating chemical agents’ but it is not easy to determine the extent to which this has moved along the spectrum from academia and industrial circles into the law enforcement, security and military apparatuses of States”*.<sup>19</sup> It is, difficult to establish the current situation: whilst certain States that have previously shown an interest in developing these agents, such as the United States,<sup>20</sup> in 2013 explicitly declared that they do not currently undertake such activities; other States known to have developed ICA weapons have given no such public undertaking.<sup>21</sup>

## 2.1 POTENTIAL DANGERS AND PROPOSED UTILITY

Proponents of ICAs have promoted their development and use in certain law enforcement scenarios such as hostage taking situations (see Russian Federation case study in section 2.1.1) where there is a desire to rapidly and completely incapacitate single or a group of individuals without causing death or permanent disability. ICAs have also been raised as a possible weapon in a variety of

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- Davison, N. and Lewer, N., 2006, *Bradford Non-Lethal Weapons Research Project (BNLWRP) – Research Report no.8*, University of Bradford, p.50.
- 15 Perry Robinson, J., (2012) *op.cit.* pp.91-92. citing Eshel, D. Israel investigates non-lethal options, *Janes Intelligence Review* (September 2001), pp. 46-47; Harvard Sussex Programme, News Chronology, CBW Conventions Bulletin, 38, December 1997; "Physician Member of Hit Team, Paper Says," *Canadian Medical Association Journal*, volume 157, number 11, December 1997, p. 1504; Cohen, A. Israel and chemical/biological weapons: history, deterrence, and arms control, *The Nonproliferation Review*, Fall-Winter 2001, pp.38-39.
- 16 Crowley, M. (2009) *op.cit.*, pp.75-76; Klochikin, V., Pirumov, V, Putilov, A and Selivanov, V., 2003, ‘The Complex Forecast of Perspectives of NLW for European Application’, *Proceedings of the 2<sup>nd</sup> European Symposium on Non-Lethal Weapons*, 13<sup>th</sup> -14<sup>th</sup> May 2003, Ettlingen, Germany, European Working Group on Non-Lethal Weapons, Pfnzta: Fraunhofer ICT; Klochinkhin, V, Lushnikov, A, Zagaynov, V, Putilov, A, Selivanov, V and Zatekvakhin, M., 2005, ‘Principles of Modelling of the Scenario of Calmative Application in a Building with Deterred Hostages’, *Proceedings of the 3<sup>rd</sup> European Symposium on Non-Lethal Weapons*, 10<sup>th</sup> -12<sup>th</sup> May 2005, Ettlingen, Germany, European Working Group on Non-Lethal Weapons, Pfnzta: Fraunhofer ICT.
- 17 Crowley, M. (2009) *op.cit.*, pp.76-78; Davison, N. (2009) *op.cit.*, pp.105-142; Furmanski, M. (2007) *op.cit.*; Pearson, A. (2007) *op.cit.*; Dando, M. and Furmanski, M. (2006) *op.cit.*
- 18 Balali-Mood, M., Steyn, P., Sydnes, L., Trapp, R. International Union of Pure and Applied Chemistry (IUPAC), *Impact of Scientific Developments on the Chemical Weapons Convention (IUPAC Technical Report)*, January 2008, p.185.
- 19 International Committee of the Red Cross, *Expert Meeting: Incapacitating chemical agents, implications for international law*, Montreux, Switzerland, 24–26 March 2010, p. 3.
- 20 OPCW, Executive Council, Seventy-Second Session, United States of America: Statement by Ambassador Robert P. Mikulak, United States Delegation to the OPCW, at the Seventy-Second Session of the Executive Council, EC-72/NAT.8 6<sup>th</sup> and 7<sup>th</sup> May 2013, 6<sup>th</sup> May 2013.
- 21 On 21<sup>st</sup> October 2013 a review was undertaken of all relevant documents publicly available on the OPCW website.

military operations, especially in situations where combatants and non-combatants are mixed.<sup>22</sup> Such perceptions of utility were noted in the 2011 report of a high-level expert panel convened by the OPCW's Director General, which stated:

“...distinctions between law enforcement, counter-terrorism, counter-insurgency and low-intensity warfare may get blurred, and certain types of chemical weapons such as ICAs [incapacitating chemical agents] may appear to offer tactical solutions to operational scenarios where civilians and combatants cannot easily be separated or distinguished.”<sup>23</sup>

A broad range of observers including scientific and medical professionals, arms control organisations, international legal experts, human rights monitors and humanitarian organisations, as well as a number of States, have voiced their disquiet about the development and utilisation of ICAs. Amongst the issues raised have been: the risks of death and permanent disability to the victims;<sup>24</sup> the dangers of “creeping legitimisation” of such agents with the erosion of the norm against the weaponisation of toxicity;<sup>25</sup> the potential for camouflaging offensive chemical weapons programmes as law enforcement chemical programmes;<sup>26</sup> the danger that employment of ICAs leads to an escalating cycle of retaliation resulting in use of classic chemical weapons;<sup>27</sup> risks of ICA proliferation to both State and non-state actors;<sup>28</sup> their potential use as a lethal force multiplier; their applicability in the facilitation of torture and other human rights violations;<sup>29</sup> and the militarisation of the life sciences.<sup>30</sup>

### 2.1.1 CASE STUDY: USE OF AN ICA BY THE RUSSIAN FEDERATION

Concerns about ICAs were heightened following the use of a presumed derivative of fentanyl by Russian Security Forces to free over 800 hostages held by heavily armed Chechen separatists in the Dubrovka theatre in Moscow, in October 2002.<sup>31</sup> According to reports, thirty minutes after an ICA

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- 22 See, for example, Fenton, G., Current and prospective military and law enforcement use of chemical agents for incapacitation, in: Pearson, A., Chevrier, M. & Wheelis, M. (2007) *op.cit.*, pp.103-123; Whitbred G. Offensive use of chemical technologies by US special operations forces in the global war on terrorism, Maxwell Paper No.37, Maxwell Air Force Base, Alabama: Air University Press, July 2006. It should be noted that other authors have questioned the utility of ICAs in certain proposed scenarios such as premeditated hostage situations, due to the availability of counter-measures. See: Wheelis, M., Non-consensual manipulation of human physiology using biochemicals, in: Pearson, A., Chevrier, M. & Wheelis, M. (2007), *op.cit.*, p.6.
- 23 OPCW, Director General, Report of the [Ekeus] advisory panel on future priorities of the Organisation for the Prohibition of Chemical Weapons, S/951/2011, 25<sup>th</sup> July 2011, paragraph 13.
- 24 British Medical Association Board of Science and BMA Science & Education department, *The use of drugs as weapons: The concerns and responsibilities of healthcare professionals*, London: BMA, May 2007
- 25 Perry Robinson, J. Categories of Challenge now facing the Chemical Weapons Convention, 52nd Pugwash CBW Workshop, 10 Years of the OPCW: Taking Stock and Looking Forward, Noordwijk, The Netherlands, 17<sup>th</sup> -18<sup>th</sup> March 2007, p.20; International Committee of the Red Cross, *Toxic Chemicals As Weapons For Law Enforcement: A threat to life and international law? Synthesis paper*, September 2012, see p.4 which highlights the potential risk of the erosion of the prohibitions on chemical and biological weapons, and p.6 which highlights the danger that use of ICAs for law enforcement creates a ‘slippery slope’ increasing likelihood that chemical weapons are reintroduced to armed conflicts.
- 26 Perry Robinson, J. (October 2007) *op.cit.*, p.31.
- 27 Pearson, A. Incapacitating Biochemical Weapons: Science, Technology, and Policy for the 21<sup>st</sup> Century, *Non-proliferation Review*, volume13, number 2, July 2006 p.170.
- 28 Pearson, A. (2006) *op.cit.*, p.172; Wheelis, M. and Dando, M. Neurobiology: A case study of the imminent militarization of biology, *International Review of the Red Cross*, volume 87, number 859, September 2005, p.564.
- 29 Crowley, M. (2009) *op.cit.*, pp.61-62.
- 30 British Medical Association (2007) *op.cit.*, p.1; Wheelis, M. and Dando, M. (2005) *op.cit.*, pp.553-571.
- 31 For descriptions of the incident see for example: Koplou, D. (2006) *op.cit.*; Pearson, A., Chevrier, M. & Wheelis, M. (2007) *op.cit.*; British Broadcasting Corporation, BBC 2, *Horizon: The Moscow Theatre Siege* (broadcast 15<sup>th</sup> January 2004), transcript on:

was pumped into the theatre, the building was stormed by Russian Spetsnaz special forces who killed all of the Chechen hostage-takers, including those left unconscious from the ICA. Although the hostages were released, over 120 died as a result of the direct effects of the agent used or of airway constriction due to their incapacitation. An undetermined, but large, additional number of hostages suffered long-term damage, or died prematurely in the years after the siege.<sup>32</sup>

Treatment of the hostages who had been poisoned was delayed and compromised by the refusal of the Russian authorities to state publicly what type of ICA had been used in the theatre for four days after the siege had ended.<sup>33</sup> On 30<sup>th</sup> October 2002 the Russian Health Minister, Yuri Shevchenko, identified the incapacitating agent as “*a mixture of derivative substances of the fast action opiate Fentanyl.*”<sup>34</sup> Mr Shevchenko further stated that: “*I officially declare: chemical substances which might have fallen under the jurisdiction of the international convention on banning chemical weapons were not used during the special operation.*”<sup>35</sup> However, the Minister refused to be more precise about the chemicals used even on 11th December 2002 when faced with a parliamentary question. He said it was a “*State secret.*”<sup>36</sup> In 2012, results of trace analysis undertaken by researchers from the U.K.’s Defence Science and Technology Laboratory (DSTL) at Porton Down of extracts of clothing and urine from survivors indicated that the ICA comprised a mixture of two anaesthetics, carfentanil and remifentanil.<sup>37</sup> At the time of writing, the Russian authorities have not disclosed full details of the chemical or chemicals used or provided information of existing stockpiles and means of delivery, or current development of such weapons.

## 2.2 FEASIBILITY OF DEVELOPING “ACCEPTABLE” ICAs

Although proponents of ICAs promote the potential benefits of their use as ‘non-lethal’ or ‘less lethal’ weapons<sup>38</sup>, many in the medical and scientific communities have questioned the feasibility of developing weapons employing incapacitating chemical agents that do not kill or seriously injure a significant proportion of the target population. In 2003, Klotz, Furmanski, and Wheelis developed a predictive model illustrating “*why seemingly non-lethal incapacitating agents may be quite lethal*

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<http://www.bbc.co.uk/science/horizon/2004/moscowtheatretrans.shtml>, viewed 30<sup>th</sup> July 2009; Amnesty International, October 2003, *Rough Justice: The law and human rights in the Russian Federation*, AI Index EUR 46/054/2003.

- 32 Wheelis, M., ‘Human impact of incapacitating chemical agents’, in *International Committee of the Red Cross, Expert Meeting: Incapacitating chemical agents, implications for international law*, Montreux, Switzerland, 24<sup>th</sup> - 26<sup>th</sup> March 2010, International Committee of the Red Cross; Levin, D. And Selivanov, V., ‘Medical and Biological Issues of NLW Development and Application’, *Proceedings of the 5th European Symposium on Non-Lethal Weapons*, 11th-13th May 2009, Ettlingen, Germany, European Working Group on Non-Lethal Weapons, Pfingstal: Fraunhofer ICT, V23, p.7.
- 33 See for example: Human Rights Watch, press release: Independent Commission of Inquiry Must Investigate Raid on Moscow Theater: Inadequate Protection for Consequences of Gas Violates Obligation to Protect Life, 30th October 2002, Human Rights Watch.
- 34 ITAR-TASS, from Moscow in English, 2112 hrs GMT 30th October 2002, as in FBIS-SOV-2002-1030, ‘Russian experts discuss use of Fentanyl in hostage crisis’, as cited by Perry Robinson, J.(October 2007) *op.cit.*
- 35 Alison, S. [from Moscow for Reuters], 1257 hrs ET 30th October 2002, ‘Russian confirms siege gas based on opiate fentanyl’, as cited in Perry Robinson, J. (2007) *op.cit.*
- 36 Amnesty International (October 2003) *op.cit.*, p.53.
- 37 Riches, J., Read, R., Black, R., Cooper, N. and Timperley, C., Analysis of Clothing and Urine from Moscow Theatre Siege Casualties Reveals Carfentanil and Remifentanil Use, *Journal of Analytical Toxicology*, volume 36, 2012, pp.647-656.
- 38 There is continuing controversy over the nature and scope of the terms ‘non-lethal’ or ‘less lethal’ weapons. In recognition of this, the term ‘less lethal’ will be placed in quotation marks and used by the author during this paper – unless quoted directly from specific individuals or organisations cited in the text

in actual use.”<sup>39</sup> In their conclusion they stated:

*“We have shown, at least within the approximations of our simple (but generous) two receptor equilibrium model, that even with a therapeutic index of 1,000 (above any known anaesthetic or sedative agent), a chemical agent used as an incapacitating weapon can be expected to cause about 10% fatalities.”*<sup>40</sup>

Furthermore, as Pearson has noted, even such predictive modelling will potentially underestimate fatalities when an ICA is used in real-life situations where there is uncontrollable variability *“both in terms of exposure (uneven concentration and exposure time) and within the target population (age, size, gender, health status and individual susceptibility).”*<sup>41</sup> As a result of such considerations, the British Medical Association, in 2007, stated:

*“The agent whereby people could be incapacitated without risk of death in a tactical situation does not exist and is unlikely to in the foreseeable future. In such a situation, it is and will continue to be almost impossible to deliver the right agent to the right people in the right dose without exposing the wrong people, or delivering the wrong dose.”*<sup>42</sup>

This position has subsequently been affirmed by a range of respected scientific organisations. In 2012, for example, a study conducted by the Royal Society concluded that:

*“It is not technically feasible to develop an absolutely safe incapacitating chemical agent and delivery system combination because of inherent variables such as the size, health and age of the target population, secondary injury (e.g. airway obstruction), and the requirement for medical aftercare.”*<sup>43</sup>

However, there is a danger, highlighted by Pearson and others, that *“increased interest in incapacitants will generate pressures that lead to the use and proliferation of weapons that are deemed “good enough”. In other words, if and when “success” comes, it may be due more to a redefinition of acceptability than to advances in science and technology.”*<sup>44</sup> Pearson has contended that if this were to occur then *“the institutionalization, conventionalization, and marketization of the new chemical weapons...may well lead to an ever-expanding definition of acceptability, ever-broader range of uses, and a more powerful array of new and improved agents.”*<sup>45</sup>

### 2.2.1 ADVANCES IN SCIENCE AND TECHNOLOGY

In the light of previous attempts to develop ICAs and related means of delivery, concerns have now been raised that State weapons programmes will seek to harness the extremely rapid advances in

39 Klotz, L. Furmanski, M. and Wheelis, M. Beware the siren's song: why 'non-lethal' incapacitating chemical agents are lethal. Federation of American Scientists, 2003.

40 Klotz, L. Furmanski, M. and Wheelis, M. (2003) *op.cit.*, p.7.

41 Pearson, A., Late and Post Cold War Research and Development of Incapacitating Biochemical Weapons, in Pearson, A., Chevrier M. & Wheelis, M. (2007) *op.cit.*, p.70. Furthermore, Pearson has noted that *“...unavoidable differences in exposure time and agent distribution after an agent is disseminated in the field make the uniform delivery of precisely controlled doses of incapacitating agents nearly impossible. This only encourages users to deliver more agent than needed to incapacitate most individuals in order to compensate for those individuals who inevitably would not receive enough. This problem is complicated even more by the need for rapid incapacitation in most scenarios, as this requires the delivery of higher doses...”* Pearson, A. (2007) *op.cit.*, p.70.

42 British Medical Association (2007) *op.cit.*, p.1.

43 Royal Society (2012) *op.cit.*, p.iv. See also Spiez Laboratory (2012) *op.cit.*

44 Pearson, A. Could incapacitating weapons become “everyday” weapons? 18<sup>th</sup> March 2008, Round table on: the expanding range of biowarfare threats, *Bulletin of the Atomic Scientists*.

45 *Ibid.*

relevant science and technology.

A range of scholars and scientific bodies have described the revolutionary changes that have taken place in the life sciences over the last 20 years, particularly in those areas concerned with our understanding of the functioning of the brain and other regulatory systems in the human body<sup>46</sup>, and have highlighted the potential implications of the misuse of such research.<sup>47</sup> In 2005 Wheelis and Dando surveyed developments and future trends in neurobiology and concluded that there were indications that military interest was already directed towards the next generation of chemical agents affecting the brain and central nervous system:

*“In addition to drugs causing calming or unconsciousness, compounds on the horizon with potential as military agents include noradrenaline antagonists such as propranolol to cause selective memory loss, cholecystokinin B agonists to cause panic attacks, and substance P agonists to induce depression. The question thus is not so much when these capabilities will arise — because arise they certainly will — but what purposes will those with such capabilities pursue.”*<sup>48</sup>

Subsequently, Tucker highlighted the danger of the misapplication of current pharmaceutical company research intended for the development of new therapeutic drugs modelled on bioregulators. *“Based on this research, it may eventually become possible to develop modified bioregulator molecules called analogues that can cross the blood-brain barrier and induce a state of sleep, confusion, or placidity, with potential applications in law enforcement, counterterrorism, and urban warfare.”*<sup>49</sup>

In a presentation to a 2010 ICRC expert meeting on ICAs, Trapp warned:

*“The explosion of knowledge in neuroscience, bioregulators, receptor research, systems biology and related disciplines is likely to lead to the discovery, amongst others, of new physiologically-active compounds that can selectively interfere with certain regulatory functions in the brain or other organs, and presumably even modulate human behavior in a predictable manner. Some of these new compounds (or selective delivery methods) may well have a profile that could make them attractive as novel candidate chemical warfare agents.”*<sup>50</sup>

Advances in discovery or synthetic production of potential incapacitating agents have occurred in parallel with developments in particle engineering and nanotechnology that could allow the delivery of biologically active chemicals to specific target organs or receptors. The implications of this were highlighted in the 2008 report by the National Research Council (NRC) on *Emerging Cognitive Neuroscience and Related Technologies*,<sup>51</sup> which warned that nanotechnologies could be used to overcome the blood-brain barrier and thereby *“enable unparalleled access to the brain.*

46 See, for example: The Royal Society (2012) *op.cit.*; The Royal Society, Brain Waves, Module 1: Neuroscience, Society and Policy, January 2011; Andreasen, N. *Brave New Brain: Conquering Mental Illness in the Era of the Genome*, Oxford University Press US, 2004; *Neuroscience 2000: A New Era of Discovery*, Symposium Organised by the Society of Neuroscience, Washington DC, 12<sup>th</sup> -13<sup>th</sup> April 1999.

47 For discussion see Spiez Laboratory (2012) *op.cit.*, pp. 15-16 &26-30; The Royal Society (2012) *op.cit.*, pp.43-52.

48 Wheelis, M. and Dando, M. (2005) *op.cit.*, p.10.

49 Tucker, J. The Future of Chemical Weapons, *The New Atlantis*, number 26, Fall2009/Winter2010, pp.3-29

50 Trapp, R. "Incapacitating chemical agents": some thoughts on possible strategies and recommendations in: ICRC (2010) *op.cit.*, p.65.

51 National Research Council, *Emerging Cognitive Neuroscience and Related Technologies*, 2008, [http://www.nap.edu/openbook.php?record\\_id=12177](http://www.nap.edu/openbook.php?record_id=12177).

*Nanotechnologies can also exploit existing transport mechanisms to transmit substances into the brain in analogy with the Trojan horse*"<sup>52</sup>

In 2012, a Royal Society *Brain Waves* project publication highlighted contemporary research which had “*demonstrated oral and intravenous delivery to the brain of two peptides, both analgesic opioid receptor agonists, using nanoparticle technology.*”<sup>53</sup> and noted that: “*such advances have great potential in the development of therapeutics but also potential applications for the delivery of incapacitating chemical agents.*”<sup>54</sup> The report however recognised that “*in the current state of development, delivery of agents with nanocarriers by oral or intravenous route would have very limited application in the development of incapacitating chemical agents.*”<sup>55</sup>

The 2008 NRC report also highlighted the potential threats resulting from developments in nanotechnologies or gas-phase techniques that allow dispersal of highly potent chemicals over wide areas.<sup>56</sup> It noted that at the present time “*pharmacological agents are not used as weapons of mass effect, because their large-scale deployment is impractical*” as it is “*currently impossible to get an effective dose to a combatant.*”<sup>57</sup> However the report stated that “*technologies that could be available in the next 20 years would allow dispersal of agents in delivery vehicles that would be analogous to a pharmacological cluster bomb or a land mine.*”<sup>58</sup> The report recommended monitoring the development of standardized delivery systems that can distribute small-molecule payloads over large areas for agricultural purposes, stating that: “*Those delivery systems would protect agents from meteorological conditions and then release agents on contact with a soldier. Of particular concern would be a single delivery system that could be easily loaded with different agents, as warheads are switched in an artillery round. This type of system would allow easy crossover to nefarious purposes.*”<sup>59</sup>

Concerns about advances in science and technology potentially applicable to the dissemination and uptake of ICAs are exacerbated by the current development, production and commercial availability of an extensive range of delivery mechanisms marketed for the dispersal of riot control agents (RCAs) some of which could be utilised or adapted for delivering other toxic chemicals, potentially including ICAs. Of particular concern are large calibre munitions and delivery systems that can be utilised for dispersing significant amounts of RCA over wide areas and/or over extended distances. A 2013 report by the Bradford Non-Lethal Weapons Research Project and the Omega Research Foundation documented development and promotion by State or commercial entities, since 1997, of a range of “wide area” RCA means of delivery including: large smoke generators, backpack or tank irritant sprayer devices; rifle grenade launchers; multiple munition launchers; automatic grenade launchers; rocket propelled grenades; mortar munitions; large calibre aerial munitions; heliborne munition dispensers; cluster munitions;

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52 National Research Council (2008) *op.cit.*, p.135.

53 Lalatsa, A, Schätzlein, A. G., Zloh, M., Malkinson, J., Uchegbu, I. A prodrug nanoparticle approach for the delivery of peptides to the brain via the oral and intravenous routes. Submitted to Martin-Banderas, L., Holgado, M., Venero, J., Alvarez-Fuentes, J. and Fernández-Arévalo, M., 2011. *Nanostructures for Drug Delivery to the Brain*. *Current Medicinal Chemistry*, 18(34):5303–5321. As cited in: Royal Society (February 2013) *op.cit.* p.52, footnote 173.

54 Royal Society (February 2013) *op.cit.* p.52.

55 *Ibid.*

56 See also National Academies of Science, *Trends in Science and Technology Relevant to the Biological and Toxin Weapons Convention: Summary of an International Workshop*. October 31 to November 3, 2010, Beijing, China, The National Academies Press: Washington, DC, 2011. See in particular: Remarks: Implications Stemming From Advances in Dual-Use Targeted Delivery Systems, Nixdorff, K. pp. 18-19.

57 National Research Council (2008) *op.cit.*, p.137.

58 National Research Council (2008) *op.cit.*, p.137.

59 National Research Council (2008) *op.cit.*, p.137.

unmanned aerial vehicles; unmanned ground vehicles; and area denial munitions.<sup>60</sup>

### 3. ICAs AND THE CHEMICAL WEAPONS CONVENTION

The Chemical Weapons Convention (CWC) prohibits the development, production, stockpiling, transfer and use of chemical weapons “*under any circumstances*”.<sup>61</sup> Although the CWC does not specifically define, nor indeed mention, incapacitating chemical agents<sup>62</sup> it does include “*incapacitation*” as part of the definition of “*toxic chemical*” under Article II (2). Thus a toxic chemical is defined as: “*...any chemical, regardless of its origin or method of production, which, through chemical action on life processes, can cause death, temporary incapacitation or permanent harm to humans or animals.*”

Under Article II.(1) a., chemical weapons are defined as including: “*toxic chemicals and their precursors, except where intended for purposes not prohibited, as long as the types and quantities are consistent with such purposes.*”

Consequently, since those chemicals promoted as ICAs can “*cause death, temporary incapacitation or permanent harm*” to their targets, they are considered to be toxic chemicals and are covered under the scope of the Convention. Such toxic chemicals would be deemed to be chemical weapons (and therefore prohibited) if they were used for purposes other than those described under Article II (9) of the Convention, or if their use was inconsistent with the types and quantities restriction of Article II(1). Among the “*purposes not prohibited*” listed in Article II (9) are: (c) “*Military purposes not connected with the use of chemical weapons and not dependent on the use of the toxic properties of chemicals as a method of warfare;* (d) *Law enforcement including domestic riot control purposes.*”

It is, therefore, clear that the use in armed conflict of toxic chemicals promoted as ICAs is prohibited, as is their development, production, acquisition, stockpiling, retention or transfer when intended for such purposes.<sup>63</sup> However, differing interpretations regarding the application of Article II.(1) and Article II (9) d., have led to alternative views from legal scholars as to whether toxic chemicals promoted as ICAs can ever be used for law enforcement purposes.<sup>64</sup> This situation is

60 Crowley, M. *Drawing the line: Regulation of “wide area” riot control agent delivery mechanisms under the Chemical Weapons Convention*, Bradford Non-Lethal Weapons Project & Omega Research Foundation, April 2013.

61 OPCW, Chemical Weapons Convention (1993) *op.cit.*; Article I.

62 Indeed the only category of chemicals specifically defined under the Convention are riot control agents (RCAs) which are defined as: “*Any chemical not listed in a Schedule, which can produce rapidly in humans sensory irritation or disabling physical effects which disappear within a short time following termination of exposure.*” OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article II (7). The use of RCAs for law enforcement is clearly allowed as long as the “types and quantities” restriction under Article II (1) is observed.

63 OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article I and Article II(1).

64 For an interpretation permitting use of ICAs only for “extreme” law enforcement purposes see: Fidler, D. Incapacitating Chemical and Biochemical Weapons and Law Enforcement under the Chemical Weapons Convention. In: Pearson, A., Chevrier, M. and Wheelis, M. (2007) *op.cit.*, pp.171-194; for more restrictive interpretations prohibiting all use of ICAs for law enforcement purposes, see: Chayes, A. and Meselson, M. Proposed Guidelines on the Status of Riot Control Agents and Other Toxic Chemicals Under the Chemical Weapons Convention, *Chemical Weapons Convention Bulletin*, volume 35, March 1997, Harvard Sussex Program, pp.13-18; Krutzsch, W. *Non-lethal chemicals for law enforcement*, *BITS Research Note 03.2*, April 2003, Berlin Information Centre for Transatlantic Security; Krutzsch, W. & Von Wagner, A. *Law enforcement including domestic riot control: The interpretation of Article II, paragraph 9(d)*, 2008. <http://cwc2008.files.wordpress.com/2008/04/krutzsch-von-wagner-law-enforcement.pdf> (accessed 1<sup>st</sup> May 2012); ICRC position on the use of toxic chemicals as weapons for law enforcement, International Committee of the Red Cross, 6<sup>th</sup> February 2013.

further complicated by there being no definition of “*law enforcement*” in the Convention. In addition, the demarcation between potentially permissible “*law enforcement*” activities and prohibited “*methods of warfare*” under the Convention remains unresolved.

As of 21<sup>st</sup> October 2013, no OPCW policy making organ (PMO) has made any interpretative statements clarifying whether toxic chemicals promoted as ICAs can be employed for law enforcement purposes and if so in what circumstances and under what constraints.<sup>65</sup> It is therefore left to individual States Parties to interpret the scope and nature of their obligations in this area, with the consequent danger that State practice may establish a “permissive” interpretation, which in turn may lead to widespread proliferation and misuse of such agents.<sup>66</sup>

#### 4. OPCW CONSIDERATION OF ICAs PRIOR TO THE THIRD REVIEW CONFERENCE

A number of commentators have highlighted the long-standing limited ability of the OPCW to address certain important or pressing issues, even if delays in action could potentially seriously weaken the effectiveness of the Convention.<sup>67</sup> Factors considered to have contributed to this situation have included the Organisation’s culture of decision-making by consensus and the consequent avoidance of difficult or controversial issues<sup>68</sup>; the wide disparity in resources and scientific and technical expertise available to State Party delegations and National Authorities; the limitations on the autonomy of the Technical Secretariat including its ability to receive and act on open source information<sup>69</sup>; limited transparency and accountability of the OPCW to civil society, and a reticence by the Organisation to receive information from and interact with relevant civil society organisations in a systematic manner<sup>70</sup>. Although the OPCW has been attempting to address some these issues, a number appear to have influenced how the Organisation has reviewed and addressed information relating to incapacitating chemical agents.

A regular five-yearly review of “*the operation of this Convention*” is mandated under the CWC<sup>71</sup>. Given their specific responsibility to “*take into account any relevant scientific and technological*

65 Analysis was undertaken of all OPCW documents publicly available on the OPCW website up to 21<sup>st</sup> October 2013.

66 Such concerns have been raised by a number of States Parties in CWC Review Conferences. Furthermore, certain States i.e. Germany and Switzerland have explicitly declared that only riot control agents can be employed in their countries for law enforcement. See Sections 4 and 5 of this paper for further discussion.

67 For example see: Mills, P. Progress in The Hague: Quarterly Review, number 34. CBW Conventions Bulletin, number 52, June 2001, pp. 3.-15. at p. 3., Harvard Sussex Program; Kelle, A. The CWC After Its First Review Conference: Is the Glass Half Full or Half Empty? Disarmament Diplomacy, issue 71, June-July 2003, Acronym Institute; An asset for the sake of peace and humanity - 10th anniversary the Chemical Weapons Ban, 2003, available at: <http://www.cwc-support.org>, as cited in Krutzsch, W. ‘Never under any circumstances’ The CWC in The Third Year After its First Review-Conference, CBW Conventions Bulletin 68, 2005, p.11, Harvard Sussex Program; Perry Robinson, J. Non lethal warfare and the Chemical Weapons Convention, Further HSP submission to the OPCW Open-Ended Working Group on Preparations for the Second CWC Review Conference, 24<sup>th</sup> October 2007, Harvard Sussex Program, p.32.

68 Scott, D. Logjam in the OPCW – Time to Limit Consensus? CWC Special Paper Number 1., December 2002, p. 4, Acronym Institute; Krutzsch, W. Ensuring True Implementation of the CWC, CBW Conventions Bulletin 76+77, 2007, Harvard Sussex Program, p.16.

69 OPCW, Director General, Report of the [Ekeus] advisory panel on future priorities of the Organisation for the Prohibition of Chemical Weapons, S/951/2011, 25<sup>th</sup> July 2011, paragraph 48.

70 Feakes, D. Workshop Report: Pugwash Study Group on the Implementation of the Chemical and Biological Weapons Conventions CWC Implementation: Balancing Confidentiality and Transparency, 15<sup>th</sup> -17<sup>th</sup> May 1998, <http://www.pugwash.org/reports/cbw/cbw2.htm> (accessed 3<sup>rd</sup> June 2009); Tucker, J. Introduction, in: The Chemical Weapons Convention: Implementation challenges and solutions (ed Tucker, J.), Washington DC: Monterey Institute of International Studies, April 2001; Moodie, M., Issues for the First CWC Review Conference, in Tucker, J. (2001) *op.cit.*; Sands, A. and Pate, J, CWC Compliance Issues, in: Tucker, J. (2001) *op.cit.*; Kelle, A. (2002) *op.cit.*; Krutzsch, W. (2005) *op.cit.*; Krutzsch, W. (2007) *op.cit.*

71 OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article VIII, paragraph 22.

*developments*<sup>72</sup> such Review Conferences should provide the appropriate forums for the Organisation to review and address the implications of State activity in developing and utilising ICAs and related means of delivery.

In the run-up to the First CWC Review Conference, which took place during April-May 2003, there did appear to have been a cautious and diplomatic attempt by the Technical Secretariat and the Scientific Advisory Board (SAB) to bring the issue of “*non-lethal*” weapons” employed for law enforcement to the attention of the Conference. For example, in its April 2003 report, the SAB highlighted its awareness: “*of concerns about the development of new riot control agents (RCAs), and other so-called "non-lethal" weapons utilising certain toxic chemicals...*”<sup>73</sup>

Similarly, although the Director General did not specifically mention ICAs in his Opening Statement<sup>74</sup> or subsequently during the Review Conference, he did raise the issue of “*non-lethal weapons*” in his preparatory Note to the Review Conference:

*“Other issues that have received some attention are related to so-called “non-lethal weapons”, and the use of toxic chemicals for law enforcement. These issues need to be carefully analysed so as to prevent any potential harm to the Convention. The Convention contains specific provisions on the use of riot control agents, and otherwise rests on the obligation that Member States shall “never under any circumstances” develop, produce, otherwise acquire, stockpile or retain, or use CW. The Member States might wish to address these issues.*”<sup>75</sup>

Despite these initiatives by the SAB and the Director General, it appears that the specific issue of the Moscow siege was off the agenda.<sup>76</sup> As one UK Official noted “*It became clear during preparations for the First Review Conference that some SPs [States Parties] were opposed to discussions on incapacitants at that time. As a result no CWC SPs [States Parties] openly raised the issue[of Moscow] for discussion during the First Conference.*”<sup>77</sup> Indeed, analysis of the Working Papers and National Statements presented at the Conference shows no explicit mention of the Russian Federation’s employment of an ICA.<sup>78</sup>

However, three States Parties – New Zealand,<sup>79</sup> Norway<sup>80</sup> and Switzerland<sup>81</sup> - did address the issue

72 OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article VIII, paragraph 22.

73 OPCW, Note by the Director-General. Report of the Scientific Advisory Board on Developments in Science and Technology, document RC-1/DG.2, The Hague, 23 April 2003, paragraph 3.14.

74 OPCW, Opening Statement By the Director General To The First Review Conference Of The States Parties To Review The Operation Of The Chemical Weapons Convention, RC-1/DG.3, 28th April 2003.

75 OPCW, Note By The Director General to the First Review Conference, RC-1/DG.1, OPCW, 17th April 2002, p.8, paragraph 3.21.

76 The sensitivities surrounding this issue at the time are illustrated by the refusal by certain States Parties to allow a statement to be delivered by the International Committee of the Red Cross to the Review Conference. This statement did not explicitly mention the Russian Federation use of an ICA but referred to “*new technologies that could undermine [the] object and purpose [of the Convention]*”. The statement text was later released by the ICRC. See: *Statement of the International Committee of the Red Cross, First Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention*, The Hague, 28th April - 9th May 2003.

77 UK Government Official, correspondence with author, 10th November 2008.

78 Copies of documents circulated at the First Review Conference including National Statements, National Working Papers, Technical Secretariat Background Papers, etc. can be found on the OPCW web site (<http://www.opcw.org>).

79 Statement by the Honourable Marian Hobbs, Minister for Disarmament and Arms Control, New Zealand, First Review Conference of the Chemical Weapons Convention General Debate, 28th April 2003, The Hague, Netherlands.

80 Johan Ludvik Lovald, Deputy Secretary General, Norwegian Ministry of Foreign Affairs, Norwegian

of “*non-lethal weapons*” employing toxic chemicals in their opening National Statements to the Review Conference. The Swiss Statement is of particular importance, declaring that:

*“In light of recent experiences, it is appropriate to reiterate that chemical weapons are **totally prohibited** whether they are lethal or non-lethal and whether their precursors or components are listed in the schedules of the Convention or not. The Conference should also recognise the need to **increase transparency** to reinforce mutual confidence. A lack of transparency exists particularly in the grey areas of the Convention where the red line between activities not prohibited and those prohibited is difficult to discern. To shed more light on these areas, the Conference could ask the States Parties to declare not only chemical products they hold for riot control purposes but for law enforcement purposes **in general**. Certain chemical agents prohibited in war may be justified for domestic use, but that being the case, it is all the more important to assure other States Parties that the production of these products poses no threat to their security.”*<sup>82</sup> [Bold as in original text].

Despite these interventions, there was no subsequent discussion of ICAs by the CWC States Parties during any of the open sessions of the Review Conference and no mention made of such agents in the Review Conference Final Document.<sup>83</sup> Kelle contended that “...*informal discussions among delegations showed that the time was not ripe*” for the inclusion of any language explicitly referring to ICAs or ‘non-lethal’ weapons in the text of the Review Document.<sup>84</sup> Although the First Review Conference was held just six months after the Moscow theatre siege, the CWC States Parties did not formally discuss the implications of this first potentially precedent-setting large-scale use of an ICA in law enforcement.

Gradually, however, the impetus to address this issue has grown within the Organisation. A review of the open source documentation indicates that in the run-up to the Second CWC Review Conference five years later, there were signs that the international governmental community was becoming more willing to discuss the potential dangers of the uncontrolled research and development of ICAs. For example, during a meeting organised under the auspices of the International Union of Pure and Applied Chemistry (IUPAC) in April 2007 in preparation for the Second Review Conference (and which included a range of governmental, industry and academic participants)<sup>85</sup>, the issue of ICAs and ‘non-lethal’ weapons was discussed in some depth. Recording these discussions, the IUPAC Report noted:

*“...[A] clear need exists for States Parties to the CWC to address these risks [ from advances in science and technology] to the object and purpose of the CWC and to agree on the CWC compatibility (or incompatibility) of endeavours to develop and field 'nonlethal'*

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Statement at the First Review Conference of the Chemical Weapons Convention General Debate, 28th April 2003, The Hague, Netherlands.

81 Statement by the head of the delegation of Switzerland, OPCW Conference of the States Parties, First Chemical Weapons Convention Review Conference, General Debate, 28th April 2003, The Hague, Netherlands.

82 Statement by the head of the delegation of Switzerland, OPCW Conference of the States Parties, First Chemical Weapons Convention Review Conference, General Debate, 28th April 2003, The Hague, Netherlands.

83 OPCW, Report of the First Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention (First Review Conference) 28th April – 9th May 2003.

84 Kelle, A (2003) *op.cit.*

85 There were 68 participants from 29 countries, coming from government, chemical industry, chemical research institutes, and universities. Seventeen participants from 11 countries were representatives from relevant government departments, National Authorities, and laboratories. Eleven participants were members of the OPCW SAB. Technical input was also provided by the OPCW in the form of presentations and posters.

*weapons that utilize toxic (e.g. incapacitating) chemicals for law enforcement purposes. Should the development and acquisition of such weapons be accepted, there would clearly be a need (as in the case of riot control agents) to agree on declaration provisions for such weapons (types, quantities, and delivery systems)."*<sup>86</sup>

The IUPAC Report concluded:

*"The risks associated with advances in science and technology would increase significantly, should dedicated [chemical weapon] programmes be able to take advantage of them. There is, therefore, good reason...to carefully assess the CWC compatibility of the development of devices that use toxic chemicals for law enforcement purposes (including so called 'nonlethal weapons')."*<sup>87</sup>

As with the First Review Conference, the OPCW Technical Secretariat<sup>88</sup> and the Scientific Advisory Board<sup>89</sup> sought to raise the issue of ICAs in preparatory papers to Member States. In its report, the SAB noted:

*"again the question of the use of incapacitating chemicals for law enforcement, pointing to the possibility that new compounds might be discovered that more closely fit the profile required of such agents. The SAB remarked, however, that in the past, only two types of chemicals acting on the central nervous system appear to have been developed into chemical-warfare agents or incapacitating agents for use in law enforcement."*<sup>90</sup>

The SAB also *"highlighted the need ... for a careful assessment of the compatibility with the Convention of the development of weapons that employ toxic chemicals (incapacitants) for law enforcement purposes."*<sup>91</sup> Furthermore, the SAB highlighted the "advantages" from a standpoint of "promoting transparency and building confidence" of "considering an extension of the Convention's declaration requirements so that States Parties would have to declare all chemicals they have stockpiled for law-enforcement purposes (types, quantities, and delivery systems)."<sup>92</sup> The SAB further noted that "such non-lethal chemicals require thorough study" and that "the terminology surrounding so-called non-lethal incapacitants also needs further elaboration."<sup>93</sup>

The SAB report also included a statement by the Director General noting that:

*"some aspects of the development of means of delivery of such incapacitants for law-enforcement purposes might be difficult to distinguish from aspects of a chemical weapons development programme. If States Parties find it desirable to evaluate the broader*

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86 Balali-Mood, M., Steyn, P., Sydnes, L., Trapp, R. International Union of Pure and Applied Chemistry (IUPAC), Impact of Scientific Developments on the Chemical Weapons Convention (IUPAC Technical Report), January 2008, p.186, paragraph 18.

87 Balali-Mood, M., Steyn P., Sydnes, L., Trapp, R. (2008) *op.cit.*, p.178, paragraph 5.

88 OPCW, Note by the Technical Secretariat Review of the Operation of the Chemical Weapons Convention Since the First Review Conference, RC-2/S/1\*, 31st March 2008.

89 OPCW, Note by the Director General, Report of the Scientific Advisory Board on Developments in Science and Technology, RC-2/DG.1, 28th February 2008.

90 OPCW, Report of the Scientific Advisory Board on Developments in Science and Technology (28th February 2008) *op.cit.*, paragraph 2.3.

91 OPCW, Report of the Scientific Advisory Board on Developments in Science and Technology (28th February 2008) *op.cit.*, paragraph 3.7.

92 OPCW, Report of the Scientific Advisory Board on Developments in Science and Technology (28th February 2008) *op.cit.*, paragraph 3.14.

93 *Ibid.*

*implications of the use of incapacitants for law-enforcement purposes, the Second Review Conference could offer an opportunity to initiate such an evaluation, and the SAB's observations might help in such an endeavour.”<sup>94</sup>*

In addition, the Director General specifically referred to “*incapacitating agents*” in his speech to the Review Conference, something he had not done at the First Review Conference. He stated that:

*“...in due course, States Parties may also wish to look into developments related to incapacitating agents and address questions such as the effect on the Convention of their possible introduction for the purposes of law enforcement and of new means for their use.”<sup>95</sup>*

The Director General further emphasised that:

*“...it is of particular importance to bear in mind the necessity of upholding the “General Purpose Criterion” and of incorporating it into national legislation in a manner that clearly outlaws the use of any toxic chemical as a weapon as defined under the Convention. This issue is particularly relevant in the context of concerns about the impact of new discoveries on the operation of the Convention.”<sup>96</sup>*

Subsequently, certain States Parties raised related concerns during their National Statements to the Review Conference, with the Swiss Government declaring that:

*“Switzerland fears that the uncertainty concerning the status of incapacitating agents risks to undermine the Convention. A debate on this issue in the framework of the OPCW should no longer be postponed.”<sup>97</sup>*

Similarly, Pakistan declared that:

*“We are particularly concerned about the question of what have on different occasions been called either non-lethal agents or incapacitating agents. Irrespective of the terminology used, it is important to bear in mind that the influence of advanced military technologies has often led to a search for exploiting real or perceived loopholes in legal instruments in order to circumvent their prohibitions. It would be unfortunate if the CWC were to be subjected to similar treatment. We believe this issue needs more attention than has so far been devoted to it.”<sup>98</sup>*

Switzerland also presented a formal National Working Paper on riot control and incapacitating agents, the first time that any State had done so at a CWC Review Conference. The Swiss Working Paper concluded by calling upon States Parties:

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- 94 OPCW, Report of the Scientific Advisory Board on Developments in Science and Technology (28th February 2008) *op.cit.*, paragraph 2.3.
- 95 OPCW, Opening Statement by the Director General to the Second Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, RC-2/DG.2, 7th April 2008, paragraph 57.
- 96 OPCW, Opening Statement by the Director General to the Second Review Conference (7th April 2008) *op.cit.*, paragraph 71.
- 97 Statement by Ambassador Dominik M. Alder, Permanent Representative of Switzerland to the OPCW, Second Review Conference of the Chemical Weapons Convention, General Debate, The Hague, Netherlands, 8<sup>th</sup> April 2008.
- 98 Statement by Mrs Kehkeshan Azhar, Acting Permanent Representative of Pakistan, Second Review Conference of the Chemical Weapons Convention, 7<sup>th</sup>-18<sup>th</sup> April 2008, p.5.

*“to consider adopting during the Second Review Conference a mandate for a discussion of, inter alia, an agreed definition of incapacitating agents, the status of incapacitating agents under the Convention, and possible transparency measures for incapacitating agents.”<sup>99</sup>*

Another important reference to this issue was contained in the *“Proposal by the NAM CWC States Parties and China on the Draft Report of the Second Review Conference.”* The paper recommended that the Conference should *“categorically condemn[ed] the use of chemical weapons including incapacitating agents or riot control agents as a method of warfare by any state, group or individual under any circumstances.”<sup>100</sup>* Previously, during a meeting of the Open Ended Working Group preparing for the Second Review Conference, the Cuban Ambassador, speaking on behalf of the Non-aligned Movement (NAM) and China stated that:

*“The advancements in Science and Technology have increased the risk of development of new riot control and incapacitating agents, in fact some of these agents are already in use. The [Second] Review Conference therefore needs to carefully consider their impact on the continued effective functioning of the Convention and make appropriate recommendations.”<sup>101</sup>*

In addition to those States willing to actively raise the issue at the Review Conference, it does appear that many more States were willing to discuss it. As a Swiss official involved in the diplomatic process noted, *“In comparison to the First Review Conference the opposition to discussing incapacitants was not as strong.”<sup>102</sup>* Indeed, during the Review Conference there appears to have been some substantive consultations regarding ICAs by States Parties during the informal drafting sessions in the last week.<sup>103</sup> As a result of such discussions, Switzerland put forward the following language on ICAs for inclusion in the Review Conference Final Document: *“In this regard, TSRC [The Second Review Conference] noted that the use of toxic chemicals for law enforcement purposes needs to be considered further in the framework of the OPCW.”<sup>104</sup>*

Although the attempts made by Switzerland and others to achieve a consensus on ICAs at the Review Conference received widespread support, agreed language was not included in the Review Conference Final Document<sup>105</sup> due to objections *“at the last minute”* by Iran.<sup>106</sup> Despite this setback it appears that the issue was rising up the OPCW’s agenda.

In December 2009, at the 14th Conference of CWC States Parties (CSP), then-departing OPCW

99 Switzerland Working Paper, Riot Control and Incapacitating Agents Under the Chemical Weapons Convention, The Hague, Netherlands, RC-2/NAT.12, 9th April 2008, p.5.

100 Note by the delegation of the Republic of Cuba addressed to the Chairperson of the Second Special Session of the Conference of the States Parties to review the operation of the Chemical Weapons Convention (Second Review Conference), The Hague, Netherlands, RC-2/CRP.2, 8 April 2008, paragraph 2.bis. Although this is an official paper on behalf of NAM and China it should not be considered as a consensus text of the 107 States Parties covered by this document, but rather a compilation of proposed amendments.

101 Statement of the Cuban Ambassador on behalf of the NAM and China, 15th meeting of the Open Ended Working Group preparing for the Second CWC Review Conference, OPCW headquarters, the Hague. Reference 071212, Disabling chemical weapons chronology, Perry Robinson, J.

102 Swiss government official, interview with author, August 2008

103 Swiss government official, interview with author, August 2008.

104 Government of Switzerland proposed text, presented during the Second Review Conference, April 2008. Copy given to author, August 2008.

105 OPCW, Report of the Second Special Session of the Conference of the States Parties to review the operation of the Chemical Weapons Convention (Second Review Conference), 7<sup>th</sup> –18<sup>th</sup> April 2008, document RC-2/4, 18<sup>th</sup> April 2008.

106 Meier, O. CWC Review Conference Avoids Difficult Issues, Arms Control Today, May 2008, [http://www.armscontrol.org/act/2008\\_05/CWC](http://www.armscontrol.org/act/2008_05/CWC). (accessed 21<sup>st</sup> October 2013).

Director General, Ambassador Pfirter, highlighted:

*“growing interest on the part of some governments and civil society, in developments related to matters where the Convention might be—perhaps purposely—ambiguous or have lacunae, and which might impact on the ultimate effectiveness of the ban on chemical weapons. **Incapacitants or non-lethal weapons is one such area when it comes to the exact types and quantities of chemicals and their permitted use. The Scientific Advisory Board could help shed some light on this matter and the Third Review Conference might offer the appropriate context for an initial formal look into it.**”*<sup>107</sup> [Emphasis added].

Although speaking in his personal capacity and not on behalf of the Technical Secretariat, the departing Director General’s intervention was important as it signalled that the issue was getting traction within the OPCW and also pointed to a possible mechanism for addressing ICAs as far as they relate to the CWC. Subsequently in December 2010, the current OPCW Director General, Ambassador Üzümcü, informed the 15<sup>th</sup> Conference of CWC States Parties about the Organisation’s continuing activities in this area. He noted that *“the SAB [Scientific Advisory Board] further addressed the question of riot control agents and incapacitating chemical agents”*.<sup>108</sup>

## 5. PREPARATIONS FOR THE THIRD REVIEW CONFERENCE

Given the continuing advances in relevant science and technology with dual-use application, since the Second Review Conference, increasing attention has been given by a range of scientific, security, arms control and humanitarian organisations to exploring the feasibility of the development of ICAs and the consequent implications for international and human security of their proliferation and employment. Prior to the Third Review Conference three important expert consultation processes were established independently to explore the issue from differing technical and policy perspectives and amongst different but overlapping participants.

The ICRC held two international expert meetings in March 2010 and April 2012 to examine a range of technical, operational, health and legal issues related to ICAs. They sought to identify possible implications for international law arising from the development, deployment and possible use of such agents. The first meeting in particular sought to establish whether there may be a risk that existing international rules might be undermined or called into question.<sup>109</sup> With the participation of experts from the policing community, the second meeting explored: whether there was any demand for ICAs and the operational and safety considerations for any introduction and use of these weapons for law enforcement; the constraints arising from the CWC, the UN Drug Conventions and international human rights law on any use of these weapons for law enforcement; and the practicalities of distinguishing between law enforcement and the conduct of hostilities.<sup>110</sup> In addition to the two meeting reports, the ICRC produced a short *Synthesis* paper that described the chemicals in question, the relevant international law, the main risks and the broad policy choices available. It concluded that:

107 OPCW, Conference of States Parties, 30<sup>th</sup> November – 4<sup>th</sup> December 2009, Opening Statement by the Director General to the Conference of the States Parties at its Fourteenth Session, C-14/DG.13, 30<sup>th</sup> November 2009.

108 OPCW, Opening Statement by the Director-General to the Conference of the States Parties at its fifteenth Session, C-15/DG.14, 29<sup>th</sup> November 2010, Conference of States Parties, 29<sup>th</sup> November - 3<sup>rd</sup> December 2010.

109 For further information see: International Committee of the Red Cross (ICRC), *Expert meeting, Incapacitating chemical agents, implications for international law, Montreux, Switzerland, 24<sup>th</sup> to 26<sup>th</sup> March 2010*.

110 For further information see: International Committee of the Red Cross (ICRC), *Expert meeting, “Incapacitating chemical agents”: Law enforcement, human rights law and policy perspectives Montreux, Switzerland, 24<sup>th</sup> to 26<sup>th</sup> April 2012*.

*“There is no dividing line, on a technical basis, between the types of toxic chemicals considered as “incapacitating chemical agents” for law enforcement and the toxic chemicals developed and used as “lethal” chemical warfare agents in past conflicts to incapacitate and kill. When used as weapons, some of the toxic chemicals considered for law enforcement can exert a potentially lethal effect in similarly small quantities to chemical warfare agents.”*<sup>111</sup>

In February 2013, informed by its international expert meeting process with participation of 14 States<sup>112</sup>, the ICRC issued its “*position*” on the issue, which stated its belief that “*the use of toxic chemicals as weapons for law enforcement purposes should be limited exclusively to riot control agents.*”<sup>113</sup> The ICRC called on all States to limit the use of toxic chemicals for law enforcement to RCAs only and to enact national legislation accordingly. It further called for States, pending such legislation, to enact national moratoria that prohibit “*research, development, production, stockpiling and use of any toxic chemical as a weapon for law enforcement that does not fit the definition of a riot control agent specified in the Chemical Weapons Convention.*” It further recommended that States should “*affirm... an international prohibition*” in this area.<sup>114</sup>

In September 2011, Switzerland’s Spiez Laboratory together with VERIFIN (the Finish Institute for the Verification of the Chemical Weapons Convention) organised a technical workshop on incapacitating chemical agents, with participation from a number of OPCW Member State officials, Technical Secretariat staff, and a range of scientific, academic, industry and NGO representatives. The workshop concentrated upon the scientific and technical aspects of the ICA issue, examining the properties, potential effects, production and utilisation of these agents as well as exploring methods for detecting their presence and confirming their identity.<sup>115</sup>

Launched in January 2011 by the Royal Society (the UK’s national academy of science), the *Brain Waves* project investigated developments in neuroscience and their implications for society and public policy. As well as exploring the beneficial application of neuroscience and neurotechnologies for health, the project examined the implications for weapons development. The project included a major research strand, incorporating an evidence gathering workshop, on the potential application of relevant science and technological developments to incapacitating chemicals and related means of delivery. The subsequent report, *Neuroscience, Conflict and Security*<sup>116</sup>, was widely distributed and promoted amongst the scientific community and the OPCW in the run up to the Third Review Conference. For example on 18th February 2013 the Royal Society held a seminar at the OPCW headquarters attended by the Director General, Technical Secretariat officials and high level representatives from State Party delegations, to promote the project findings, a central aspect of which concerned ICAs and the potential threats arising to the Convention from advances in and

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111 International Committee of the Red Cross, *Toxic Chemicals As Weapons For Law Enforcement: A threat to life and international law? Synthesis paper*, September 2012, p.2.

112 According to the ICRC the following States participated in one or both ICRC expert meetings: Australia, China, Czech Republic, Finland, France, Germany, India, Norway, Pakistan, Russian Federation, South Africa, Switzerland, United Kingdom and the United States. See: ICRC, *Toxic Chemicals As Weapons For Law Enforcement: A threat to life and international law? Synthesis paper*, September 2012, p.6.

113 ICRC position on the use of toxic chemicals as weapons for law enforcement, International Committee of the Red Cross, 6<sup>th</sup> February 2013.

114 ICRC (February 2013) *op.cit.*

115 For details of the workshop proceedings and participants, see: Spiez Laboratory, *Technical Workshop on Incapacitating Chemical Agents, Spiez, Switzerland, 8<sup>th</sup> - 9<sup>th</sup> September 2011*, Spiez Laboratory, Federal Office for Civil Protection, January 2012.

116 Royal Society, *Brain Waves Module 3: Neuroscience, conflict and security*, London: RS Science Policy Centre, February 2012.

convergence of relevant science and technology.<sup>117</sup>

The three expert consultation processes have enabled the complex and inter-connected nexus of scientific, technological, health, legal and security considerations and attendant policy issues related to ICAs to be analysed and addressed by scientific and technical experts from academia and civil society organisations, CWC States Parties, the Technical Secretariat and inter-governmental organisations, and have drawn expertise from a range of communities and control regimes beyond the OPCW. As well as informing the development of relevant organisational and national positions on the issue, these three expert consultation processes and associated promotional meetings have been extremely important in facilitating informal discussion and the exchange of perspectives between key CWC State Party diplomats involved in the discourse on this issue.

In addition to these processes, the issue of ICAs was also an important element of the IUPAC workshop and subsequent report analysing the “*impact of scientific developments on the chemical weapons convention*”<sup>118</sup>, intended to inform the SAB and States Parties in their preparations for the Third Review Conference. IUPAC specifically reviewed “*scientific developments related to CNS-modulating chemicals and the delivery of such chemicals to targeted biological tissues*” and “*explored their potential use in law enforcement as so-called “incapacitating chemical agents”*”.<sup>119</sup> Although IUPAC examined the issue from a scientific and technical perspective, the IUPAC Report recognised that: “*The decision on the appropriateness of the development and use of ICAs for law enforcement purposes, including whether such use would be permitted under the provisions of the CWC, is an issue which requires political, legal, and other inputs.*”<sup>120</sup>

In its analysis IUPAC highlighted the challenges faced in attempting to employ ICAs for law enforcement that “*titrate’ a target group so that the desired incapacitating effect is achieved without an unacceptable level of fatality*” and highlighted the further challenges “*to ensure effect and selectivity across individual variations in characteristics such as age, health, or sensitivities to particular agents.*”<sup>121</sup> The Report concluded that although “*S&T [science and technology] on classes of chemicals which could possibly be employed as ICAs is continuing to advance*” the discussions at the workshop “*indicated that the currently available S&T does not have the capabilities required to enable the delivery of such “incapacitating chemical agents” for law enforcement purposes in a ‘safe’ manner.*”<sup>122</sup>

## 5.1 ANALYSIS BY THE TECHNICAL SECRETARIAT AND THE SCIENTIFIC ADVISORY BOARD

Although a range of distinguished medical and scientific bodies have disputed the feasibility of developing truly safe ICAs and highlighted the dangers of State research in this area, these bodies have no formal standing within the OPCW. The Scientific Advisory Board, in contrast, was specifically established to provide the OPCW with independent expert advice on science and

117 Among those attending were representatives from Algeria, Australia, Canada, Cuba, Germany, Iran, Iraq, Ireland, Japan, Malaysia, the Netherlands, Pakistan, Poland, the Russian Federation, South Africa, Switzerland, the UK and the USA. For details of the key findings, agenda and attendees see: The Royal Society, The Chemical Weapons Convention and convergent trends in science and technology, April 2013, [http://royalsociety.org/uploadedFiles/Royal\\_Society\\_Content/policy/projects/brain-waves/2013-08-04-Chemical-Weapons-Convention-and-convergent-trends.pdf](http://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/projects/brain-waves/2013-08-04-Chemical-Weapons-Convention-and-convergent-trends.pdf) (accessed 21<sup>st</sup> October 2013).

118 Smallwood, K. Trapp, R. Mathews, R. Schmidt, B. and Sydnes, L. Impact of scientific developments on the Chemical Weapons Convention (IUPAC Technical Report), *Pure and Applied Chemistry*, volume 85, number 4, pp.851-881, 2013.

119 Smallwood, K. et al (2013) *op.cit.*, see in particular: pp.854-855 and pp.865-866.

120 Smallwood, K. et al (2013) *op.cit.* p.855.

121 Smallwood, K. et al (2013) *op.cit.* p.855.

122 Smallwood, K. et al (2013) *op.cit.* p.855.

technology relevant to the Convention and its findings provide an important reference document for States Parties delegations.<sup>123</sup>

In April 2010, at its 15<sup>th</sup> meeting, the SAB initiated renewed consideration of ICAs:

*“The SAB recognised the complexities presented by riot control agents and incapacitating chemical agents, and their treatment under the Convention. It recalled that both the SAB itself and the Director-General had made reference to the matter on several occasions. The SAB further recognised that it could be of assistance to the Director-General in categorising toxic chemicals that fall within the general definitions of riot control agents or incapacitants for law enforcement.”*<sup>124</sup>

Furthermore *“the SAB recommended that it start deliberations on riot control agents and incapacitating chemical agents by receiving briefings on the different technical, legal, law enforcement, military, and political aspects surrounding the subject in order to identify the technical areas in which it can be of most assistance.”*<sup>125</sup>

Consequently, the SAB considered the technical issues relating to ICAs at five of its subsequent meetings.<sup>126</sup> Former SAB Chair, Mr Stefan Mogl has explained that: *“Following a review and discussion of literature data on the potency and toxicity of certain potential candidate chemicals for ICAs, the SAB concluded that incapacitants should be considered just as toxic chemicals, most of which would be non-Scheduled.”*<sup>127</sup> In addition Mogl noted that: *“utilizing ICA in the field poses great operational challenges, most notably that you cannot properly control the dose in the area of agent release and that you don’t know the susceptibility of individuals exposed to the agent, and therefore cannot exclude that the agent may cause serious harm: incapacitants should not be called “non-lethal” agents.”*<sup>128</sup>

The SAB findings and recommendations with regard to these agents were incorporated into the SAB report for the Third Review Conference on “Developments in Science and Technology”.<sup>129</sup> The SAB report highlighted the extreme limitations in operational employment of ICAs and clearly implied that current ICAs were not suitable for use in law enforcement.

*“The Board considers the term “non-lethal” as inappropriate when referring to chemicals intended for use as incapacitants, because for all chemicals toxicity is a matter of dosage. The Board noted that chemicals considered having high safety margins in the context of controlled pharmaceutical use can have very low safety margins in the context of incapacitants when factors such as uneven dissemination, variability in human response,*

123 OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article VIII(21)h.

124 OPCW, Report of the fifteenth Session of the Scientific Advisory Board, SAB-15/1, 14th April 2010, paragraph 13.2.

125 OPCW, SAB-15 (14<sup>th</sup> April 2010) *op.cit.*, paragraph 13.3.

126 OPCW, Report of the Nineteenth Session of the Scientific Advisory Board, SAB-19/1, 12<sup>th</sup> September 2012; OPCW, Report of the Eighteenth Session of the Scientific Advisory Board, SAB-18/1, 19<sup>th</sup> April 2012; OPCW, Report of the Seventeenth Session of the Scientific Advisory Board, SAB-17/1, 23<sup>rd</sup> November 2011; OPCW, Report of the Sixteenth Session of the Scientific Advisory Board, SAB-16/1, 6<sup>th</sup> April 2011; OPCW, Report of the Sixteenth Session of the Scientific Advisory Board, SAB-16/1, 6<sup>th</sup> April 2011.

127 Author’s interview with Mr Stefan Mogl, former Chair of the SAB, September 2013.

128 Author’s interview with M Stefan Mogl, former Chair of the SAB, September 2013.

129 OPCW, Conference of the States Parties, Report of the Scientific Advisory Board on Developments in Science and Technology for the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, Third Review Conference RC-3/DG.1, 8<sup>th</sup> – 19<sup>th</sup> April 2013 29<sup>th</sup> October 2012.

*and the possible need for a rapid onset are required. It was also emphasised that the issue is not just what incapacitating chemical is used for law enforcement purposes, but how it is used, and the consequences such a use may have.”*<sup>130</sup>

In an interview with the author, Dr Ralf Trapp posited that the SAB by stating that ICAs could not be classed as “non-lethal” weapons *“effectively concurred with the findings of the Spiez meeting i.e. that fundamentally no incapacitant can be developed that does not endanger the lives or the health of a significant proportion of the target population.”*<sup>131</sup>

In its previous meetings, the SAB had received briefings of the discussions and findings of the ICRC and Spiez/VERIFIN meetings on ICAs, from Board members who participated in these processes. The reports of these events were scrutinised by the SAB and were cited in its report to the Review Conference. The SAB consequently stated that:

*“In the view of the SAB the technical discussion on the potential use of toxic chemicals for law enforcement purposes has been exhaustive. It may continue its discussions once technical information about specific candidate chemicals and/or dissemination systems is made available.”*<sup>132</sup>

The SAB was not tasked and consequently did not make a determination of whether any specific existing agents could be used as ICAs without significant risk to the health or life of the target population. However according to Mogl, *“The SAB stand ready to respond if they are asked by the DG [Director General], in future, to assess the effects of a specific chemical agent that has been discovered (or developed) and proposed (or deployed) for use as an incapacitant.”*<sup>133</sup>

In terms of explicit proposals, the SAB restricted itself to the technical side of the issue and recommended that:

*“...the Secretariat start preparations for verification activities, relevant to incapacitating chemicals, that could be required in an investigation of alleged use (IAU). Such preparations should include developing analytical methods and procedures, as well as collecting analytical reference data for the analysis of such chemicals. The Secretariat should invite laboratories in Member States to contribute to this effort.”*<sup>134</sup>

In his formal “Response” to the SAB Report, prepared for the Third Review Conference, the Director General highlighted the SAB findings on ICAs and committed the Technical Secretariat to *“pursue efforts to enhance its chemical-analysis capabilities”* and to *“work with designated laboratories on this issue.”*<sup>135</sup> Whilst the SAB had restricted itself to the technical aspects related to ICAs and refrained from any explicit statement on the acceptability under the Convention of the

130 OPCW, Conference of the States Parties, Scientific Advisory Board Report on Developments in Science and Technology for the Third Review Conference (29th October 2012) *op.cit.*, paragraph 12.

131 Author’s interview with Dr Ralf Trapp, independent CBW consult and former Technical Secretariat official, 7<sup>th</sup> August 2013.

132 OPCW, Conference of the States Parties, Scientific Advisory Board Report on Developments in Science and Technology for the Third Review Conference (29<sup>th</sup> October 2012) *op.cit.*, paragraph 13.

133 Author’s interview with Stefan Mogl, former Chair of the SAB, September 2013.

134 OPCW, Conference of the States Parties, Scientific Advisory Board Report on Developments in Science and Technology for the Third Review Conference (29<sup>th</sup> October 2012) *op.cit.*, paragraph 13.

135 OPCW, Conference of the States Parties, Note by the Director-General, Response to the Report of the Scientific Advisory Board on Developments in Science and Technology for the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, Third Review Conference RC-3/DG.2, 8<sup>th</sup> – 19<sup>th</sup> April 2013 31<sup>st</sup> January 2013, paragraph 15.

use of such agents for law enforcement, the Director General suggested that:

*“Given the SAB’s assessment of the technical discussion, States Parties might consider using the Third Review Conference as an opportunity to further discuss the broader implications of the use of toxic chemicals for law-enforcement purposes.”*<sup>136</sup>

## 5.2 CONSIDERATION OF ICAs AT THE OPEN ENDED WORKING GROUP

The Open Ended Working Group (OEWG) is the forum in which CWC States Parties and the Technical Secretariat undertake the extensive preparatory work of reviewing the implementation of the Convention, in preparation for the Review Conference. During the OEWG process preparing for the Third Review Conference<sup>137</sup>, the issue of ICAs was formally raised by Switzerland who submitted a proposal paper for the consideration of the States Parties. The paper recommended that the Final Report of the Review Conference incorporate a definition of incapacitating chemical agents which distinguished them from riot control agents and described them as *“Toxic chemicals...not listed in the Schedules...designed to cause temporary incapacitation to human or animals...for the sole purpose of domestic law enforcement in types and quantities consistent with such purposes...”*<sup>138</sup> The paper also recommended that the Review Conference ask *“the Executive Council to initiate discussions on what measures should be taken to enhance transparency between States Parties on Incapacitating Chemical Agents for law enforcement purposes and to report back to the Conference at its next regular session.”*<sup>139</sup>

During the OEWG process, on 1st November 2012, the SAB Chair briefed the participating State Party delegations on the findings and recommendations of the SAB Report for the Third Review Conference concerning developments in science and technology, which included a summary of the SAB findings and recommendations on ICAs. This was the second briefing to the OEWG by the SAB Chair, an earlier briefing was on the functioning of the OPCW SAB.<sup>140</sup>

Although the nature of the OEWG discussions concerning ICAs is unknown, the OEWG did include the following paragraph in its Draft Provisional Text for the Review Conference Final Document: *“The Third Review Conference noted that consultations by the policy-making organs could be convened on any developments or issues that States Parties consider relevant to the object and purpose of the Convention, including on incapacitating chemical agents.”*<sup>141</sup>

## 5.3 CONSIDERATION OF ICAs AT THE REVIEW CONFERENCE

Once again Switzerland led the calls for the Organisation to address incapacitating chemical agents

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136 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, *op.cit.* 31<sup>st</sup> January 2013, paragraph 16.

137 The OEWG for the Third Review Conference, which was chaired by Ambassador Baghli of Algeria, held 33 meetings open to all State Party delegations.

138 Switzerland, Incapacitating Chemical Agents – Proposal for the Third Review Conference, November 2012, copy held by author.

139 Switzerland, Incapacitating Chemical Agents – Proposal for the Third Review Conference, November 2012, copy held by author.

140 Author’s interview with Mr Stefan Mogl, former Chair of the SAB, September 2013.

141 OPCW, Conference of the States Parties, Working Group for the Preparation of the Third Review Conference, Draft Provisional Text, Third Review Conference, 8<sup>th</sup> - 19<sup>th</sup> April 2013, WGRC-3/1, RC-3/CRP.1, 28<sup>th</sup> March 2013, Article 21.

at the Third Review Conference and distributed the proposal paper<sup>142</sup> which had previously been presented to the Open Ended Working Group. In his opening statement to the Review Conference, Ambassador Markus Borlin declared that Switzerland was “*particularly concerned about the issue of so-called incapacitating chemical agents...toxic chemicals for law enforcement purposes that are not riot control agents and act on the central nervous system.*” Ambassador Borlin explained that “*In Switzerland, the use of toxic chemicals for law enforcement purposes is limited exclusively to riot control agents.*” He highlighted Switzerland’s “*fear that the silence and uncertainty surrounding the use of toxic chemicals for law enforcement purposes other than riot control agents risks eroding the Convention.*” He stated that “*a debate on this issue in the framework of the OPCW should no longer be delay[ed] until the next Review Conference, which is why my delegation has proposed language for this Conference’s final document.*”<sup>143</sup>

Support for addressing incapacitating chemical agents appeared to have grown considerably since the previous Review Conference. Concerns regarding ICAs were raised by a number of States in their National Statements to the Review Conference including Germany<sup>144</sup> which also submitted a working paper on this issue<sup>145</sup>, Ireland<sup>146</sup>, Norway<sup>147</sup>, Romania,<sup>148</sup> Slovakia<sup>149</sup> the United Kingdom,<sup>150</sup> the United States<sup>151</sup>, and from the International Committee of the Red Cross<sup>152</sup>. For example, Ambassador Rolf Nickel of Germany noted that: “*In the past years the issue of “toxic chemicals for law enforcement” has been extensively discussed in various fora outside the OPCW...There is now a substantial body of scientific analysis on developments [regarding “incapacitating chemical agents”] that have taken place since the entry-into-force of the*

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142 Switzerland, Incapacitating Chemical Agents – Proposal for the Third Review Conference, November 2012, copy held by author.

143 OPCW, Conference of States Parties, Switzerland: Statement by Markus Borlin, Permanent Representative of Switzerland to the OPCW, General Debate, Statement at the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, 8<sup>th</sup> April 2013

144 OPCW, Conference of States Parties, Germany: Statement by Ambassador Rolf Wilhelm Nickel, Commissioner of the Federal German Government for Disarmament and Arms Control, at the Third Review Conference, Third Review Conference RC-3/NAT.28, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013

145 Germany, Toxic chemicals for law enforcement, Third Review Conference, RC-3/NAT.44, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 16<sup>th</sup> April 2013.

146 Ireland: Statement by H.E. Mary Whelan, Permanent Representative of Ireland to the OPCW, at the Third Review Conference, Third Review Conference, RC-3/NAT.51, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013

147 Norway: Statement at the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, Third Review Conference, RC-3/NAT.25, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 8<sup>th</sup> April 2013

148 Romania: Statement by H.E. Director General Nineta Bărbulescu, Head of the National Authority for the Implementation of the Chemical Weapons Convention in Romania, at the Third Review Conference, Third Review Conference, RC-3/NAT.37, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013.

149 Slovakia: Statement by Ambassador H.E. Jaroslav Chlebo, Permanent Representative of the Slovak Republic to the OPCW, at the Third Review Conference, Third Review Conference, RC-3/NAT.27, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013

150 OPCW, Conference of the States Parties, Third Review Conference, United Kingdom: Statement by Mr Alistair Burt, Parliamentary Under Secretary of State for Foreign and Commonwealth Affairs, at the Third Review Conference, RC-3/NAT.22, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013.

151 OPCW, Conference of States Parties, United States of America: Statement by Rose E. Gottemoeller, Acting Under Secretary for Arms Control and International Security, at the Third Review Conference, Third Special Session RC-3/NAT.45, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013.

152 OPCW, Conference of the States Parties, International Committee of the Red Cross: Statement by Christine Beerli, Vice President, International Committee of the Red Cross, at the Third Review Conference, International Committee of the Red Cross: Statement by Christine Beerli, Vice President, International Committee of the Red Cross, at the Third Review Conference, Third Review Conference, RC-3/NAT.72, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 10<sup>th</sup> April 2013.

*Convention.*”<sup>153</sup> Citing, the Review Conference’s “*specific mandate to “take into account any relevant scientific and technological developments”*”, Germany consequently recommended that the Conference should “*through its final declaration initiate discussions on the issue of “toxic chemicals for law enforcement.”*”<sup>154</sup> He also declared that “*Germany, in her national implementing legislation, explicitly restricts the use of toxic chemicals for law enforcement purposes to those that fall under the definition of riot control agents.*”<sup>155</sup>

Of particular importance were supportive statements from the United Kingdom and the United States both of which had previously undertaken research into ICAs.<sup>156</sup> The US Acting Under Secretary for Arms Control and International Security, Ms Rose Gottemoeller, explicitly declared that “*the development, production, acquisition, stockpiling, or use of incapacitating chemical agents—or any other toxic chemicals—in types and quantities inconsistent with purposes not prohibited by the Chemical Weapons Convention, is clearly prohibited by Article I of the Convention.*”<sup>157</sup> Ms Gottemoeller highlighted concerns that “*illicit programmes could possibly be concealed under the guise of a legitimate treaty purpose, such as law enforcement*” and further warned that States Parties “*must all be vigilant to ensure that incapacitating chemical agents and other technologies do not jeopardise the twin goals of the Convention—the destruction of all chemical weapons and the prevention of the re-emergence of chemical weapons.*”<sup>158</sup>

In his statement on behalf of the United Kingdom, Mr Alistair Burt, Under Secretary of State for Foreign and Commonwealth Affairs, noted the UK’s involvement in the “*ongoing discussions on the place of incapacitating chemical agents in the Convention, particularly given scientific change and the absence of any definition or common understanding of law enforcement.*”<sup>159</sup> He highlighted the reports of the Royal Society and the SAB, noted that “[*both have set out the scientific position as well as advancing our understanding of the complex issues surrounding this topic*” and declared that the OPCW should “*address such relevant issues and show leadership*”.<sup>160</sup> He recommended that the OPCW “*should work together to establish a norm to discourage the use of chemicals more toxic than Riot Control Agents for law enforcement and consider transparency measures or limitations.*”<sup>161</sup> Finally, he “*unequivocally*” stated that “*the UK neither holds, nor is developing, any incapacitating chemical agents for law enforcement...and encourage[d] all other States Parties to state their positions on this question.*”<sup>162</sup>

Although a number of States expressed their positions with regard to ICAs in their opening National Statements to the Review Conference, there appears to have been no substantive discussion in any of the subsequent formal plenary sessions of either the permissibility of the use of such agents for

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153 OPCW, Conference of States Parties, Germany: Statement by Ambassador Rolf Wilhelm Nickel, Commissioner of the Federal German Government for Disarmament and Arms Control, at the Third Review Conference, Third Review Conference RC-3/NAT.28, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013.

154 *Ibid.*

155 *Ibid.*

156 In the UK, ICA research reportedly occurred in the 1950s and 1960s, but this had apparently ended by the early 1970s. In contrast, in the US, ICA research was reported to be continuing in the 1990s and into the 2000s. See for example, Royal Society (2012) *op.cit.*, pp.10-11 for the UK, and pp.12-14 for the US.

157 OPCW, Conference of States Parties, United States of America: Statement by Rose E. Gottemoeller, Acting Under Secretary for Arms Control and International Security, at the Third Review Conference, Third Special Session RC-3/NAT.45, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013.

158 *Ibid.*

159 OPCW, Conference of States Parties, United Kingdom: Statement by Mr Alistair Burt, Parliamentary Under Secretary of State for Foreign and Commonwealth Affairs, Third Review Conference, RC-3/NAT.22, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 9<sup>th</sup> April 2013.

160 *Ibid.*

161 *Ibid.*

162 *Ibid.*

law enforcement purposes or of the implications of developments in science and technology for regulation of such agents under the Convention. Instead, as one senior official from a Western European and Others Group (WEOG) State noted “*the whole debate was largely conducted in the margins [of the Conference] and centred around “finding acceptable text for the [Final] Report[of the Review Conference] on how we could take forward work on the ICA issue in the context of the CWC.”*<sup>163</sup>

Horner and Meier, citing “*several diplomatic sources*” reported that: “*the [Swiss] proposal ran into opposition, particularly from Russia.*”<sup>164</sup> However, following discussions and consultations between Switzerland, Russia and other concerned States Parties, agreement on language for the Review Conference Final Report appeared to have been reached on Friday - the last day of the Conference.<sup>165</sup> The proposed text stated:

*“The Third Review Conference noted that the application of toxic chemicals, which through their chemical action on life process can cause temporary incapacitation, for purposes not prohibited by the Convention, including for law enforcement purposes, could be discussed by meetings of governmental experts of States Parties, operating on the basis of consensus. A factual report of such meetings, setting out the views expressed, would be transmitted to the Executive Council for further consideration.”*<sup>166</sup>

According to Guthrie, however, “*later in the day the US delegation suggested that there were legal issues that were raised by the agreed text and that there would need to be guidance from Washington.*”<sup>167</sup> According to Horner and Meier, US concerns about the text – which had been proposed by the Russian delegation - concerned its being interpreted as allowing the inclusion of riot control agents in future discussions. A previous version of the text – agreed by the US - had explicitly excluded these agents from the scope of such discussions.<sup>168</sup> By Friday evening the US delegation in the Hague had received no guidance from Washington and so the Swiss delegation withdrew the proposed paragraph from the draft Final Report text.<sup>169</sup>

In their closing statements to the Review Conference, the Netherlands<sup>170</sup>, New Zealand<sup>171</sup>, Norway and Switzerland<sup>172</sup> formally registered their disappointment that the Conference had failed to include language on incapacitating chemical agents in the Final Report. Mr Philippe Brandt, Deputy Permanent Representative of Switzerland to the OPCW, did however note that “*Due to the*

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163 Author’s interview with a senior official from a Western European and Other Groups (WEOG) State, 30<sup>th</sup> July 2013.

164 Horner, D. and Meier, O. Syria Issue Roils CWC Review Conference, *Arms Control Today*, June 2013.

165 Guthrie, R. CWC Review Conference Report, number 11, Monday 22<sup>nd</sup> April 2013.

166 Draft text on toxic chemicals employed for law enforcement proposed for inclusion in the Review Conference Final Report, 19<sup>th</sup> April 2013. Copy of text provided to the author by delegate to the Review Conference.

167 Guthrie, R. CWC Review Conference Report, number 11, Monday 22<sup>nd</sup> April 2013.

168 Horner, D. and Meier, O. Syria Issue Roils CWC Review Conference, *Arms Control Today*, June 2013.

169 Guthrie, R. CWC Review Conference Report, number 11, Monday 22<sup>nd</sup> April 2013. See also Horner, D. and Meier, O. June 2013, *op.cit.*

170 Netherlands: Statement by H.E. Jan Lucas van Hoorn, Permanent Representative of the Netherlands to the OPCW, at the Closing Session of the Third Review Conference, Third Review Conference RC-3/NAT.60, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 19<sup>th</sup> April 2013.

171 Guthrie reports that statements of regret were made by New Zealand and Norway, see: Guthrie, R. CWC Review Conference Report, number 11, Monday 22<sup>nd</sup> April 2013. The OPCW website does not include copies of such statements to date.

172 OPCW, Conference of the States Parties, Third Review Conference, Switzerland, Statement by Philippe Brandt, Deputy Permanent Representative of Switzerland to the OPCW at the closing session of the Third Review Conference, RC-3/NAT.57, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 19<sup>th</sup> April 2013.

*increasing support we [have] experience[d] during the last months the momentum has been built. Consequently we will continue our efforts in order to further develop it.*"<sup>173</sup>

#### 5.4 RELATED ISSUES CONSIDERED AT THE THIRD REVIEW CONFERENCE

In addition to explicitly discussing incapacitating chemical agents, States Parties at the Third Review Conference also addressed three related issues – the General Purpose Criterion, strengthening the verification regime, and the implications of convergence - that potentially have important implications for how the Organisation will address ICAs in the future.

In its report on Developments in Science and Technology, the SAB considered the application of the General Purpose Criterion and declared that it was “*of the view that the definition of toxic chemicals in the Convention, the “general-purpose criterion”, encompasses all potential candidate chemicals.*”<sup>174</sup> In his Response to the SAB Report, The Director General supported and reinforced the Board’s position, stating his belief “*that [the General Purpose Criterion] is particularly important in the context of preventing the future re-emergence of chemical weapons and the misuse of toxic chemicals.*”<sup>175</sup> The Director General informed the Review Conference that: “*The Secretariat will continue to monitor developments relating to unscheduled and novel toxic chemicals and will explore ways in which to augment its technical capabilities in this area.*”<sup>176</sup>

The Director General further informed the Conference that: “*The Secretariat is augmenting its capabilities to monitor developments in science and technology and to provide advice to the Director-General.*”<sup>177</sup> He stated that “*The Secretariat will seek advice from the SAB on the feasibility of establishing a systemic approach to tracking and evaluating advances in science and technology, given the pace at which these advances are occurring.*”<sup>178</sup> Given the widely expressed concerns that certain science and technology advances may open the way for the discovery or development of a range of non-scheduled toxic chemicals and their potential employment as ICA weapons<sup>179</sup>, these commitments by the Director General would potentially strengthen the Organisation’s ability to effectively track advances related to such weapons development programmes.

In addition, the Director General recommended that the Review Conference: “*reaffirm the comprehensive nature of the Convention’s prohibitions...*”<sup>180</sup> with regard to the range of toxic chemicals covered under its scope. Subsequently, in its Final Report, the Review Conference:

*“...reaffirmed the continued relevance of the definitions contained in Article II of the*

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- 173 OPCW, Conference of the States Parties, Third Review Conference, Switzerland, Statement by Philippe Brandt, Deputy Permanent Representative of Switzerland to the OPCW at the closing session of the Third Review Conference, RC-3/NAT.57, 8<sup>th</sup> – 19<sup>th</sup> April 2013, 19<sup>th</sup> April 2013.
- 174 OPCW, Conference of the States Parties, Scientific Advisory Board Report on Developments in Science and Technology for the Third Review Conference (29<sup>th</sup> October 2012) *op.cit.*, paragraph 9.
- 175 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, *op.cit.* 31st January 2013, paragraph 9.
- 176 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, *op.cit.* 31st January 2013, paragraph 9.
- 177 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, *op.cit.* 31st January 2013, paragraph 29.
- 178 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, *op.cit.* 31st January 2013, paragraph 29.
- 179 To date the only ICA to have been listed under a CWC Schedule has been BZ (Schedule 2.a.) and two of its immediate precursors, 3-Quinuclidinol and Benzilic Acid (both Schedule 2.b.).
- 180 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, *op.cit.* 31st January 2013, paragraph 10.

*Convention, which ensure the comprehensive nature of the prohibition of chemical weapons under the Convention. The definitions...of the terms “chemical weapons” and “chemical weapons production facility”, were found to adequately cover the impact of developments in science and technology on the Convention’s prohibitions and to provide for the application of these prohibitions to any toxic chemical, except where such a chemical is intended for purposes not prohibited by the Convention, and as long as the types and quantities involved are consistent with such purposes.”<sup>181</sup>*

With regard to verification, the SAB Report on Developments in Science and Technology noted that:

*“Advances in production technology may also affect how certain types of toxic chemicals—such as toxins, bioregulators, or other classes of chemicals, including incapacitating agents—can be produced, a development that will necessitate adjustments to current verification practices.”<sup>182</sup> [Emphasis added]. Consequently the Board recommend that the Technical Secretariat should “strengthen its efforts to stay abreast of technological developments in these areas.”<sup>183</sup>*

The SAB further noted that *“The identification of non-scheduled or novel toxic chemicals remains unaddressed, which may be important, for example, for an IAU [investigation of alleged use], when there is evidence that a toxic chemical has been used for prohibited purposes, but no scheduled chemicals can be found.”<sup>184</sup> The Board highlighted its concerns that “OPCW inspection teams are not in a position to analyse for toxic chemicals that are outside of the Annex on Chemicals without sending the samples to designated laboratories.”<sup>185</sup> The Board considered that “From a technical perspective this is a weakness in detecting the re-emergence of chemical weapons.”<sup>186</sup> Furthermore, the SAB stated “The OPCW Central Analytical Database (OCAD)<sup>187</sup> is a critical element for OPCW on-site analysis. The Secretariat must ensure that the content of this database is adequate to allow the OPCW to meet future verification challenges.”<sup>188</sup>*

In his Response to the SAB Report, the Director General noted *“the SAB’s views on the OPCW Central Analytical Database and, as he did in his responses to the previous SAB reports to the First and Second Review Conferences...[and agreed]...that the Secretariat needs to have analytical data*

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181 OPCW, Report of the Third Review Conference, Part B, (19th April 2013) *op.cit.*, paragraph 9.141

182 OPCW, Conference of States Parties, SAB Report to the Third Review Conference (29th October 2012) *op.cit.*, paragraph 20.

183 OPCW, Conference of States Parties, SAB Report to the Third Review Conference (29th October 2012) *op.cit.*, paragraph 20.

184 OPCW, Conference of States Parties, SAB Report to the Third Review Conference (29th October 2012) *op.cit.*, paragraph 16.

185 OPCW, Conference of States Parties, SAB Report to the Third Review Conference (29th October 2012) *op.cit.*, paragraph 16.

186 OPCW, Conference of States Parties, SAB Report to the Third Review Conference (29th October 2012) *op.cit.*, paragraph 16.

187 The OPCW Central Analytical Database (OCAD) is a reference library of analytical data. It contains validated spectroscopic and chromatographic data of chemicals of relevance to the CWC. Its primary purpose is to enable on-site analysis with approved OPCW inspection equipment as provided for in the Convention. Certain States, most notably Switzerland, have advocated an expansion of OCAD. See, for example: OPCW, Conference of States Parties, Switzerland, Inclusion of data on non-scheduled chemicals in the OPCW chemical analytical database to facilitate comprehensive chemical weapons analysis, Second Review Conference, RC-2/NAT.9, 9<sup>th</sup> April 2008.

188 OPCW, Conference of States Parties, SAB Report to the Third Review Conference (29th October 2012) *op.cit.*, paragraph 23.

on relevant unscheduled chemicals... ”<sup>189</sup> He supported the Board’s findings on verification, stating his belief that “it is essential to maintain a robust verification regime that keeps pace with developments in science and technology, and with other external factors and developments in the OPCW.”<sup>190</sup> He announced that “he has asked the SAB to establish a new TWG on verification.”<sup>191</sup> He also gave his commitment that “The Secretariat will, in the future, implement many of the additional recommendations that have been made by the SAB.”<sup>192</sup>

In its turn, the Review Conference “noted that the verification system should continue to be improved in a manner consistent with the Convention in response to advances in science and technology, taking into consideration, as appropriate, the SAB’s advice to the Director-Genera...”<sup>193</sup> In addition, the Review Conference “Encouraged the Secretariat to maintain and further develop, update and improve its practices in regard to its capability to perform sampling and analysis under the different scenarios envisaged in the Convention...without creating new obligations for States Parties...”<sup>194</sup> The Review Conference specifically encouraged the Secretariat to “maintain its efforts to keep updated the OPCW Central Analytical Database and to continue to submit proposed updates in this regard to the Council for its approval”<sup>195</sup>

A substantial element (20 paragraphs) of the SAB Report on Developments in Science and Technology was devoted to an analysis of the convergence of chemistry and biology, and the implications for the implementation of the Convention. In summary, the SAB stated that:

“Advances considered under the general term “convergence of chemistry and biology” are accelerating at an unprecedented rate, particularly in synthetic biology. A feature of the technology is that it overlaps the remits of the Convention and the BWC [Biological Weapons Convention], and some aspects, for example, bioregulators and their analogues, risk falling between the two. The SAB considers it important that the Secretariat expands its in-house knowledge of these developments. The SAB recommends that regular assessments of the implications for implementation of the Convention should be undertaken, using expertise within the SAB, the TWG [Temporary Working Group] on the convergence of chemistry and biology, and the Secretariat. The SAB further recommends that the Secretariat establish a process for increasing the interaction of the Secretariat and SAB with experts associated with the BWC, in particular with its Implementation Support Unit.”

The SAB analysis and proposals were supported by the Director General. In his Response to the SAB Report, the Director General recommended that the Conference “acknowledge that... the convergence of chemistry and biology and other sciences is a development that will likely pose both challenges and opportunities for the Convention;”<sup>196</sup> and “note that this is a field of rapid advances

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189 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, (31st January 2013) *op.cit.*, paragraph 32.

190 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, (31st January 2013) *op.cit.*, paragraph 38.

191 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, (31st January 2013) *op.cit.*, paragraph 38.

192 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, (31st January 2013) *op.cit.*, paragraph 38.

193 OPCW, Report of the Third Review Conference, Part B, (19th April 2013) *op.cit.*, paragraph 9.71

194 OPCW, Report of the Third Review Conference, Part B, (19th April 2013) *op.cit.*, paragraph 9.79 (d)

195 OPCW, Report of the Third Review Conference, Part B, (19th April 2013) *op.cit.*, paragraph 9.79 (d)

196 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, (31st January 2013) *op.cit.*, paragraph 7 (a).

and therefore requires systematic monitoring by the Secretariat and by the SAB.”<sup>197</sup> He also recommended that the Conference “encourage States Parties to submit their own assessments of the convergence of the sciences”<sup>198</sup> and “recommend increased interaction between technical experts in chemistry and biology.”<sup>199</sup>

There was widespread recognition amongst States Parties of the importance of the Organisation addressing convergence, and at least nine States and the European Union raised the issue in their Statements during the General Debate<sup>200</sup>. To a large extent the SAB and DG proposals were endorsed by the Conference which in its Final Document noted:

*“the increasing convergence of chemistry and biology, and welcomed the establishment of the SAB temporary working group on the convergence of chemistry and biology to explore and consider the potential implications of these advances to the Convention.”*<sup>201</sup> Furthermore, the Conference specifically “encouraged States Parties and the Secretariat to continue to keep the convergence of chemistry and biology under review, including through the SAB temporary working group on the convergence of chemistry and biology, and encouraged greater interaction between relevant experts”<sup>202</sup>

In the light of the Review Conference Final Document, it is clear that the convergence of the life and chemical sciences has been recognised as a central concern for the Organisation for the foreseeable future. This has important potential consequences for how the Organisation will monitor and address activities related to mid-spectrum agents including bioregulators, peptides and toxins, and provides potential routes for States Parties to raise concerns regarding the potential development and use of such chemicals as weapons.

## 6. FOLLOW-UP AFTER THE THIRD REVIEW CONFERENCE

According to Horner and Meier: “Several participants argued that the broad support at the review conference for further discussions means that incapacitants are now likely to be discussed in the policy-making organs of the OPCW.”<sup>203</sup> Citing an interview with the Director General, Horner and Meier stated that although “[Ambassador] Üzümcü conceded that the OPCW Technical Secretariat did not receive a mandate by the review conference to pursue the issue of incapacitants...he said he expects states-parties such as Switzerland to “continue to raise this issue.””<sup>204</sup>

Similarly in an interview with the author, Trapp stated his belief that “there is enough political support for incapacitants to be made an issue in the Executive Council and for that body to establish an appropriate mechanism for addressing this issue.”<sup>205</sup> He argued that “It now depends

197 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, (31st January 2013) *op.cit.*, paragraph 7 (b).

198 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, (31st January 2013) *op.cit.*, paragraph 7 (b).

199 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, (31st January 2013) *op.cit.*, paragraph 7 (c).

See National Statements by Australia, Belgium, Ireland, the Netherlands, New Zealand, Nigeria, Singapore, the United Kingdom and the Statement on behalf of the European Union, available on OPCW website, <http://www.opcw.org/> (accessed 21<sup>st</sup> October 2013).

201 OPCW, Report of the Third Review Conference, (19<sup>th</sup> April 2013) *op.cit.*, Part B, paragraph 9.142.

202 OPCW, Report of the Third Review Conference, Part B, (19<sup>th</sup> April 2013) *op.cit.*, paragraph 9.155 (c)

203 Horner, D. and Meier, O. (June 2013) *op.cit.*

204 Horner, D. and Meier, O. (June 2013) *op.cit.*

205 Author’s interview with Dr Ralf Trapp, independent CBW consult and former Technical Secretariat official, 7<sup>th</sup> August 2013.

*on those States that have championed the issue such as the Swiss, the Germans, the UK and to some extent the US to bring proposals forward to the EC [Executive Council].”*<sup>206</sup>

The commitment to continue pursuing the issue of ICAs was apparent in the May Executive Council, the first such meeting following the Review Conference. In a general debate upon the Conference, the Norwegian Ambassador, Ms. Anniken Krutnes, stated that: *“Let me assure you that Norway will continue to bring this issue forward. We will therefore encourage a debate under the auspices of the Executive Council or in any other appropriate OPCW forum at the earliest convenience.”*<sup>207</sup> Similarly, the Irish Ambassador, Mrs Mary Whelan, speaking on behalf of the European Union stated that *“the failure to finalise a reference to incapacitating agents in the outcome document...in spite of widespread support”* was *“a matter of regret.”*<sup>208</sup> She also declared: *“As the European Union made clear in its statement to the Third Review conference, we need to think about how the Convention can be strengthened to ensure no chemical weapons are developed or produced under the guise of purposes not prohibited. The European Union therefore believes that the OPCW should be able to consider any issue of relevance to the Organisation and hopes that this matter can be taken up again soon.”*<sup>209</sup>

US Ambassador, Dr Robert Mikulak, expressed his disappointment *“that time ran out before final agreement could be reached on language relating to substances termed “incapacitating chemical agents”.”*<sup>210</sup> He did however note that the United States believed *“that agreement on language is within reach.”*<sup>211</sup> And committed the US to working *“closely and intensively with the Swiss and other delegations so that this important discussion can continue.”*<sup>212</sup> He concluded by reconfirming *“very clearly and directly... that the United States is not developing, producing, stockpiling, or using incapacitating chemical agents.”*<sup>213</sup>

The issue of incapacitating chemical agents was once again discussed at the July 2013 Executive Council meeting. In his statement, the Norwegian Deputy Representative, Mr Mosberg-Stangeby, highlighted Norway's view that: *the use of incapacitating chemical agents poses risks to life and health and is a potential threat to the prohibition of chemical weapons. In order to amend this anomaly in the Convention, Norway supports greater awareness and transparency with regards to these weapons.”*<sup>214</sup> Mr Mosberg-Stangeby also stated that *“Norway supports the goal of establishing a discussion on the topic of toxic chemicals as weapons for law enforcement, so-called incapacitating chemical agents. While we still regret that no consensus could be reached at the Third Review Conference, we find it positive that the discussion will be continuing with interested*

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206 Author’s interview with Dr Ralf Trapp, independent CBW consult and former Technical Secretariat official, 7<sup>th</sup> August 2013.

207 OPCW, Executive Council, Seventy-Second Session, Norway: Statement by H.E. Ambassador Anniken R. Krutnes, Permanent Representative of Norway to the OPCW, at the Seventy-Second Session of the Executive Council, EC-72/NAT.6, 6<sup>th</sup> and 7<sup>th</sup> May 2013, 6<sup>th</sup> May 2013.

208 OPCW, Statement on behalf of the European Union delivered by H.E. Mary Whelan Permanent Representative of Ireland to the Organisation for the Prohibition of Chemical Weapons at the Seventy-Second Session of the Executive Council.

209 *Ibid.*

210 OPCW, Executive Council, Seventy-Second Session, United States of America: Statement by Ambassador Robert P. Mikulak, United States Delegation to the OPCW, at the Seventy-Second Session of the Executive Council, EC-72/NAT.8 6<sup>th</sup> and 7<sup>th</sup> May 2013, 6<sup>th</sup> May 2013.

211 *Ibid.*

212 *Ibid.*

213 *Ibid.*

214 OPCW, Executive Council, Seventy-Third Session, Norway, Statement by Mr Thomas Mosberg-Stangeby, Charge D' Affaires A.I, Deputy Permanent Representative of Norway to the OPCW, EC-73/NAT.8, 16<sup>th</sup> – 19<sup>th</sup> July 2013, 17<sup>th</sup> July 2013.

*States Parties.*<sup>215</sup>

Despite the commitments by individual States Parties during and following the Review Conference, no specific mechanism for discussing ICAs has been proposed for consideration by the Executive Council or any other PMO, and it is unclear at present how and when the issue will be addressed by the Organisation. In contrast to this apparent hiatus, the Review Conference did allow the Secretariat to undertake activities in certain relevant technical areas.

The Review Conference “*strongly reaffirmed the relevance of developments in science and technology to the Convention*”<sup>216</sup> and noted both the SAB’s Report on Developments in Science and Technology to the Third Review Conference (RC-3/DG.1) and the Director-General’s Response to the SAB Report (RC-3/DG.2). In his Note to the October 2013 Executive Council, the Director General stated that by such actions, “*States Parties have thus demonstrated a strong commitment to ensuring that effective policy solutions are developed and that they are grounded in the science underpinning the SAB’s advice.*”<sup>217</sup>

It can be argued that by formally “noting” both the SAB Report and the Director General’s Response without further comment or qualification, the Review Conference effectively gave its tacit agreement for the Technical Secretariat to implement the recommendations contained in the latter document. This included the Director General’s recommendation relating to “*preparations for verification activities*” regarding an investigation of alleged use of ICAs and specifically committing the Secretariat to “*pursue efforts to enhance its chemical-analysis capabilities*” and to “*work with designated laboratories on this issue.*”<sup>218</sup> The Director General’s Note to the October 2013 Executive Council clearly expressed his intention to ensure that the Technical Secretariat makes active progress on all the recommendations contained in his Response. “*In RC-3/DG.2, the Director-General made 29 recommendations, which are being brought forward by the Secretariat for implementation. In the event that action by the policy-making organs is required, the Secretariat will develop appropriate policy advice. The Secretariat intends to brief States Parties at an early opportunity.*”<sup>219</sup>

In its 20<sup>th</sup> Meeting, the SAB and relevant Technical Secretariat personnel discussed follow-up from the Review Conference and how the 29 recommendations contained in the Director General’s Response would be implemented.<sup>220</sup> The SAB were informed that “*the Director-General will develop policy options [for these recommendations] and, where necessary, involve the policy-making organs.*”<sup>221</sup> The Report of the 20<sup>th</sup> SAB Meeting subsequently noted that “*The SAB stands ready to assist with technical advice at any step in the process.*”<sup>222</sup>

Previously, in September 2012 the 19<sup>th</sup> SAB meeting had considered the specific activities that the

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215 OPCW, Executive Council, Seventy-Third Session, Norway (17<sup>th</sup> July 2013) *op.cit.*

216 OPCW, Report of the Third Review Conference, Part B, (19<sup>th</sup> April 2013) *op.cit.*, paragraph 9.4

217 OPCW, Note by the Director General, The Impact of Developments in Science and Technology in the Context of the Chemical Weapons Convention, Seventy-Fourth Session, 8<sup>th</sup>-11<sup>th</sup> October 2013, EC-74/DG.1, 24<sup>th</sup> July 2013, paragraph 5.

218 OPCW, Conference of the States Parties, Note by the Director-General, Response to the Report of the Scientific Advisory Board on Developments in Science and Technology for the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, Third Review Conference RC-3/DG.2, 8<sup>th</sup> – 19<sup>th</sup> April 2013 31<sup>st</sup> January 2013, paragraph 15.

219 OPCW, Note by the Director General, EC-74/DG.1 (24<sup>th</sup> July 2013) *op.cit.*, paragraph 5.

220 OPCW, Scientific Advisory Board, Twentieth Session, SAB-20/1, 10<sup>th</sup> – 14<sup>th</sup> June 2013, 14<sup>th</sup> June 2013, Report of the twentieth session of the Scientific Advisory Board, CS-2013-7922(E).

221 OPCW, Scientific Advisory Board, Twentieth Session (14<sup>th</sup> June 2013) *op.cit.*, paragraph 11.3.

222 OPCW, Scientific Advisory Board, Twentieth Session (14<sup>th</sup> June 2013) *op.cit.*, paragraph 11.4.

Secretariat should undertake as part of its preparations for verification activities that could be required during an investigation of alleged use of an ICA. The Board recommended that:

*“Such preparations should include the development of analytical methods and procedures, as well as the collection of analytical reference data for the analysis of such chemicals. One development in analytical instrumentation that may contribute to the analysis of ICAs is high-resolution mass spectrometry (HRMS). The Secretariat should invite laboratories in Member States to contribute to the development of respective analytical methods and to the collection of analytical reference data.”*<sup>223</sup>

A senior official from a WEOG State has argued that: *“It is for the Director General to take action.”*<sup>224</sup> However the official has noted that the Director General and Technical Secretariat may potentially face opposition from certain Member States on aspects of implementation. *“A problem however is the likes of India who object to the effective expansion of OCAD.”*<sup>225</sup> In contrast, in certain areas, the official has argued, the Technical Secretariat has a greater remit for action: *“...there is nothing to stop the TS [Technical Secretariat] running training courses for inspectors to enable them to address ICAs in a CI [Challenge Inspection] or IAU [Investigation of Alleged Use].”*<sup>226</sup>

In addition to potential political constraints, Mogl has highlighted the technical difficulties which the Technical Secretariat will face in developing measures for verification of alleged use of ICAs:

*“The focus of the Organisation’s onsite and offsite analysis capability has been to establish the presence or absence of Scheduled chemicals. But in the future there could, instead, be a use of non-Scheduled toxic chemicals, such as incapacitants, which may trigger an investigation of alleged use. In order for the Organisation to establish whether a toxic chemical has been used and which toxic chemical it was, it needs to be able to detect and identify such possibly unknown non-Scheduled chemicals. This is not an easy technical problem for the OPCW laboratory and the TS to solve as they are currently limited in the analytical techniques and reference databases they can utilise.”*<sup>227</sup>

Mogl has argued that:

*“The TS does not have the necessary on-sight equipment to do this, and such equipment will not become available for on-site analysis in the near future. Also, the TS cannot create a database to cover all possible non-Scheduled chemicals, and even if it did, such a database would always be limited to chemicals currently known. Off-site analysis at designated laboratories would be the only way to analyse such samples but OPCW proficiency testing currently is not practicing the identification of such non-scheduled chemicals that could be ICA.”*<sup>228</sup>

Consequently Mogl has argued that the Organisation should evaluate together with designated laboratories how the OPCW proficiency testing scheme could help establishing methods to solve

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223 OPCW, Scientific Advisory Board, Nineteenth Session, Report of the nineteenth session of the Scientific Advisory Board, SAB-19/1, 10<sup>th</sup> – 12<sup>th</sup> September 2012, 12<sup>th</sup> September 2012, paragraph 7.16.

224 Author’s interview with a senior official from a WEOG State, 30<sup>th</sup> July 2013.

225 *Ibid.*

226 *Ibid.*

227 Author’s interview with Stefan Mogl, former Chair of the SAB, September 2013.

228 Author’s interview with Stefan Mogl, former Chair of the SAB, September 2013.

such questions.<sup>229</sup>

## 7. CONCLUSIONS AND RECOMMENDATIONS REGARDING THE APPLICATION OF OPCW MECHANISMS FOR REVIEWING AND ADDRESSING SCIENCE AND TECHNOLOGY DEVELOPMENTS TO ICAs

In order to fulfil its primary objectives to permanently eradicate existing chemical weapons and to prevent the development and proliferation of further chemical weapons, the OPCW must firstly ensure effective monitoring and assessment of advances in those scientific and technological disciplines of relevance to the Convention. Secondly, the information gained from such activities needs to inform the development of appropriate policy and practice to meet the challenges and utilise the opportunities arising from such developments. This study has attempted to analyse how this two-step process has been applied by the Organisation in the case of incapacitating chemical agents.

The Chemical Weapons Convention through its General Purpose Criterion has an extremely wide scope of coverage, and if applied correctly by its States Parties, ensures that all existing toxic chemicals and also all those yet to be discovered or developed are covered within its ambit. Consequently it is clear that as toxic chemicals, all potential candidate ICAs including pharmaceutical chemicals, bio-regulators and toxins, would be covered under the scope of the Convention. Furthermore, development, stockpiling, transfer or utilisation of such agents would be permissible only for purposes “not prohibited”, and only where the “types and quantities” of such toxic chemicals were consistent with such purposes. The use in armed conflict of toxic chemicals promoted as ICAs is clearly prohibited under the CWC. Whilst riot control agents can be legitimately used in law enforcement, there are differing interpretations as to whether, and in what circumstances, other toxic chemicals could be employed for such purposes.

Analysis of open source information from the mid-1990s onwards indicates that a number of States appear to have conducted research relating to ICAs and/or possible means of delivery at some stage during this period and there has been one large scale deployment of such agents by the Russian Federation in a counter-terrorist operation in 2002. The potential implications of the application of the rapidly evolving life and chemical sciences and associated technologies to the development of ICAs and associated means of delivery have been explored by a range of highly respected national and international scientific organisations including the UK Royal Society, the US National Academy of Sciences, Switzerland's Spiez Laboratory, and the International Union of Pure and Applied Chemistry, and the findings of such bodies have been brought to the attention of the OPCW.

It is clear from the current study, that those OPCW entities - namely the Scientific Advisory Board, the Director General and the Technical Secretariat - required to inform and/or render “*specialized advice in areas of science and technology relevant to the Convention*”<sup>230</sup> to the policy making organs (PMOs), have undertaken careful review and analysis of the information available concerning ICAs and developments in associated science and technology and have reported their findings to the relevant PMOs, including three successive Review Conferences.

In its report to the Third Review Conference, the SAB detailed developments in science and

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229 Author's interview with Stefan Mogl, former Chair of the SAB, September 2013.

230 See: OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article VIII, paragraph 21,(h).

technology relevant to the Convention in this area stating that “*the technical discussion on the potential use of toxic chemicals for law enforcement purposes has been exhaustive.*” The SAB stated that ICAs should not be considered as “non-lethal” weapons and highlighted the extreme limitations in operational employment of ICAs for law enforcement. It also recommended that the Organisation “*start preparations for verification activities, relevant to incapacitating chemicals, that could be required in an investigation of alleged use (IAU).*” These findings were supported by the Director General who formally committed the Technical Secretariat to begin preparations for verification of ICAs. The Director General also committed the Technical Secretariat to develop its capabilities to undertake technology monitoring and horizon-scanning more broadly.

Whilst the SAB, Technical Secretariat and the Director General have provided timely objective expert analysis of science and technology developments of relevance to incapacitating chemical agents and related means of delivery, the States Parties through the PMOs have been unwilling or unable to effectively review such information and adequately discuss the application of the Convention in this area. Consequently they have failed to agree appropriate policy and practice for the Organisation to meet the challenges raised by ICAs. Factors contributing to these failures have included: the complexity of the issues arising from ambiguities and divergent interpretations of the Convention in these areas; the wide disparity in resources and scientific and technical expertise available to State Party delegations; the time constraints and multiple competing policy issues to be addressed by State Party delegations during the Review Conference; the Organisation's culture of decision-making by consensus and the consequent avoidance of difficult or controversial issues.

Although the Third Review Conference failed to establish a mechanism to facilitate discussion amongst States Parties regarding ICAs, there does appear to be widespread support for this initiative within the Organisation, and it is hoped that the modalities of such a mechanism can be agreed by States Parties through a relevant PMO in the near future, if sufficient States continue to champion the issue.

The international community's response to advances in weapons-related science and technology has often been inadequate and late, introducing partial and ineffective controls (if any are introduced at all) long after a new weapons technology has spread to and been employed by State and non-State actors. With the issue of ICAs - because proliferation has so far been relatively limited - there is still time to act. There is now an opportunity for the OPCW to take a precautionary and preventative approach, and address the development and use of ICAs and related means of delivery. If the OPCW does not do so in the near future there is a danger that advances in relevant scientific disciplines together with current and potential future State research and development into ICAs and related means of delivery may lead to proliferation and misuse of such weapons.

## 7.1 RECOMMENDATIONS FOR CWC STATES PARTIES

CWC States Parties both individually and collectively should consider the following activities and processes for addressing the regulation of ICAs and their means of delivery:

(A) AFFIRM CURRENT NATIONAL PRACTICE IS TO RESTRICT USE OF TOXIC CHEMICALS FOR LAW ENFORCEMENT TO RIOT CONTROL AGENTS, AND REAFFIRM EXISTING PROHIBITION ON THE USE OF TOXIC PROPERTIES OF ALL CHEMICALS IN ARMED CONFLICT

In the Third CWC Review Conference Switzerland and Germany stated that the only toxic chemicals that can be employed for law enforcement purposes in their countries are riot control agents. Where appropriate, other countries should give similar public undertakings.

States Parties should also publicly reaffirm that under the CWC, the use in armed conflict of the toxic properties of all chemicals (including those promoted as ICAs) is prohibited, as is their development, production, acquisition, stockpiling, retention or transfer when intended for such purposes.<sup>231</sup>

(B) INTRODUCE NATIONAL MORATORIA ON THE DEVELOPMENT, STOCKPILING, TRANSFER AND USE OF ICAs AND RELATED MEANS OF DELIVERY INTENDED FOR LAW ENFORCEMENT PURPOSES

To date, a small number of CWC States Parties including the UK and the US have made formal public statements confirming that they do not currently undertake development of ICAs, do not hold stockpiles of such agents and do not utilise such agents. States Parties should now consider introducing unilateral national moratoria on the development, stockpiling, transfer and use of ICAs and related means of delivery intended for law enforcement. Such moratoria would not be designed to restrict development, transfer or use of chemical agents legitimately employed for medical or veterinary purposes, but solely those intended for employment in law enforcement. If requisite agreement for this were forthcoming, a group of like-minded States Parties could introduce a moratorium on such agents and related means of delivery at the pluri-lateral level. Such moratoria should remain in place until CWC States Parties collectively determine whether the use of ICAs in law enforcement is prohibited under the Convention.

(C) INITIATE A MECHANISM WITHIN THE OPCW TO DISCUSS THE EMPLOYMENT OF ICAs IN LAW ENFORCEMENT

At both the Second and Third CWC Review Conferences, proposals were submitted to establish a mechanism within the OPCW to facilitate discussion amongst States Parties regarding ICAs, their employment in law enforcement, and possible transparency measures for such agents.<sup>232</sup> Given the widespread support amongst States Parties for action in this area, a State Party or group of like-minded States Parties should once again present proposals at a suitable policy making organ (i.e. the forthcoming Conference of States Parties or a future Executive Council meeting) to establish such a mechanism. Under such proposals an open ended working group or some other formal mechanism could be established to make recommendations on these issues for consideration by the Executive Council or the Conference of States Parties. Such formal processes would be open to all States Parties that wished to participate and would reach their conclusions by consensus.

Alternatively, State Parties could initiate a process of informal meetings of experts similar to the model developed by the Biological and Toxin Weapons Convention (BTWC) States Parties in 2002 to "*discuss and promote common understandings and promote effective action*" on implementation measures.<sup>233</sup> As part of this informal process, expertise could be drawn from a range of relevant state sectors including national implementation officials, law enforcement officials, experts in international law, and scientific advisors. These informal expert meetings could run in parallel or

231 OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article I and Article II(1).

232 See: Conference of the States Parties, *Switzerland: Riot Control and Incapacitating Agents Under the Chemical Weapons Convention*, OPCW document RC-2/NAT.12, 9 April 2008, p. 5; Draft text on toxic chemicals employed for law enforcement proposed for inclusion in the Review Conference Final Report, 19<sup>th</sup> April 2013. Copy of text provided to the author by delegate to the Review Conference.

233 The utility of such a model for addressing CWC-related issues requiring clarification has previously been proposed. See, for example, R. Mathews, "Convergence of biology and chemistry: implications for the verification regime of the Convention, including potential role of the other chemical production facilities regime", seminar on the OPCW's Contribution to Security and the Non-Proliferation of Chemical Weapons, 11–12 April 2011, OPCW Headquarters, The Hague; and Spiez Laboratory, *Technical Workshop on Incapacitating Chemical Agents, Spiez, Switzerland, 8–9 September 2011, 2012*, p. 7.

prior to the formal mechanism and could present recommendations to the formal mechanism or directly to an appropriate OPCW body.

Irrespective of the modalities of the facilitation process employed, it is important that CWC States Parties give full and careful consideration to all relevant international law and agreements that may be applicable to the employment of ICAs in law enforcement. First and foremost the application of the CWC – bearing in mind its object and purpose - should be considered. In addition, and given the nature of the toxic chemicals under consideration and the proposed contexts for their use, the applicability of the following instruments and law should be explored: the Biological and Toxin Weapons Convention (BTWC), international human rights law, the Single Convention on Narcotic Drugs and the Convention on Psychotropic Substances.<sup>234</sup> Such analysis is important firstly because of the direct obligations that arise from these instruments and law which may either prohibit or severely restrict development, stockpiling, transfer or use of ICAs, and secondly because international law should inform the interpretation and implementation of the relevant provisions of the CWC.

In addition, the OPCW mechanism should be informed by technical reports and briefings provided to it by the SAB on the implications of relevant science and technology developments. If deemed appropriate, the OPCW facilitation process could also explore the regulation of means of delivery that could be employed for the dissemination of ICAs. In addition to any OPCW process agreed, it would be highly beneficial if informal inter-governmental consultation mechanisms on this issue were established.

#### (D) UTILISE EXISTING CWC CONSULTATION, INVESTIGATION AND FACT-FINDING MECHANISMS

Existing mechanisms can be used when activities of potential concern are reported, such as the development or use of ICAs and related means of delivery by law enforcement, security or military forces, particularly if human rights violations or breaches of international humanitarian law have been alleged. If bilateral consultations with the relevant States do not prove fruitful, concerned States Parties should consider a formal request under Article IX of the CWC.

In addition CWC States Parties who are also States Parties to the BTWC should:

#### (E) UTILISE BTWC INTER-SESSIONAL PROCESSES TO EXPLORE SCIENCE AND TECHNOLOGY DEVELOPMENTS OF RELEVANCE TO ICAs AND RELATED MEANS OF DELIVERY

A number of BTWC States Parties including Australia<sup>235</sup>, the Netherlands<sup>236</sup>, the Russian

234 For further discussion see: Crowley, M. Potential implications for disarmament and other areas of international law”, in International Committee of the Red Cross, Expert Meeting: Incapacitating chemical agents, implications for international law, Montreux, Switzerland, 24–26 March 2010, pp. 42–53; Hampson, F. Potential Implications for human rights law, in ICRC (2010) *op.cit.* pp.53-57; Doswald-Beck, L. Assessing “Incapacitating chemical agents” under human rights law, in International Committee of the Red Cross (ICRC), Expert meeting, “Incapacitating chemical agents”: Law enforcement, human rights law and policy perspectives Montreux, Switzerland, 24th to 26th April 2012, pp.39-45. Vandova, V., The European Court of Human Rights’ Judgment in the case of *Finogenov and others V. Russia*, in ICRC (2012) *op.cit.* pp.46-49.

235 United Nations, Seventh Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, New scientific and technological developments relevant to the Convention, Addendum: Submissions from States Parties, BWC/CONF.VII/INF.3/Add.1, 23rd November 2011, paragraph 66.

236 Netherlands, Background Paper on Scientific and Technological Developments Relevant to the Biological Weapons Convention, Sixth Review Conference, 2006, paragraph 6, <http://www.opbw.org/>

Federation<sup>237</sup>, Sweden<sup>238</sup>, the U.K.<sup>239</sup> and the U.S.<sup>240</sup> have previously highlighted the potential dangers to the BTWC of the misuse of bioregulators and peptides (or other biologically active agents that could be utilised as ICAs) in background scientific papers for the 6<sup>th</sup> and/or 7<sup>th</sup> BTWC Review Conferences.

The Seventh BTWC Review Conference decided to include in the 2012-2015 inter-sessional programme a standing agenda item to review developments in the field of science and technology related to the Convention.<sup>241</sup> Such a review is intended to explore developments that have “*potential for uses contrary to the provisions of the Convention*”<sup>242</sup> as well as those that have “*potential benefits for the Convention.*”<sup>243</sup> The range of specific topical scientific subjects that will be considered over the five year period include: “*advances in the understanding of pathogenicity, virulence, toxicology, immunology and related issues*” which will be considered in 2014;<sup>244</sup> and “*advances in production, dispersal and delivery technologies of biological agents and toxins*” which will be considered in 2015.<sup>245</sup> Individual BTWC States Parties should utilise the important opportunity afforded by the Inter-Sessional Review process to highlight existing research and development (and likely future trajectories) of potential concern including those relating to the development of ICAs and related means of delivery.

## 7.2 RECOMMENDATIONS FOR THE DIRECTOR GENERAL AND THE TECHNICAL SECRETARIAT

The Director General and the Technical Secretariat, in consultation with the SAB where appropriate, should:

(A) DEVELOP APPROPRIATE VERIFICATION MECHANISMS APPLICABLE TO ICAs AND THEIR MEANS OF DELIVERY

In his formal “Response” to the SAB Report, prepared for the Third Review Conference, the Director General highlighted the SAB recommendations to start “*preparations for verification*

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- 237 Russian Federation, (unofficial translation), Background Paper on Scientific and Technological Developments Relevant to the Biological Weapons Convention, Sixth Review Conference, 2006, paragraph 15, <http://www.opbw.org/>
- 238 Sweden, Background Paper on Scientific and Technological Developments Relevant to the Biological Weapons Convention, 2006, Sixth Review Conference, paragraph 3, <http://www.opbw.org/>
- 239 United Kingdom, Background Paper on Scientific and Technological Developments Relevant to the Biological Weapons Convention, Sixth Review Conference, 2006, paragraph 55, <http://www.opbw.org/>; United Nations, New scientific and technological developments relevant to the Convention, Addendum: Submissions from States Parties (November 2011) *op.cit.*, paragraph 125.
- 240 United States, Background Paper on Scientific and Technological Developments Relevant to the Biological Weapons Convention, Sixth Review Conference, 2006, paragraph 30, <http://www.opbw.org/>
- 241 United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit.*, Final Document, Article 1, paragraph 2.
- 242 United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit.*, Decisions and recommendations, Review of developments in the field of science and technology related to the Convention, paragraph 22. (a).
- 243 United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit.*, Decisions and recommendations, Review of developments in the field of science and technology related to the Convention, paragraph 22. (b).
- 244 United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit.*, Decisions and recommendations, Review of developments in the field of science and technology related to the Convention, paragraph 23.
- 245 See United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit.*, Decisions and recommendations, Review of developments in the field of science and technology related to the Convention, paragraph 23.

*activities*” for an investigation of alleged use of ICAs, and specifically committed the Secretariat to “*pursue efforts to enhance its chemical-analysis capabilities*” and to “*work with designated laboratories on this issue.*”<sup>246</sup> In addition to developing analytical methods and procedures, the TS should engage in associated activities such as training courses for inspectors to enable them to address ICAs in investigations of alleged use.

Since these activities come under the responsibility and competency of the Director General and the Technical Secretariat, such preparations should be initiated as soon as is feasible.<sup>247</sup> It is envisaged that such measures would be taken forward by relevant Technical Secretariat staff in consultation and coordination with the SAB including the Temporary Working Group on Verification<sup>248</sup>, as appropriate. In developing protocols and methodologies for verification of alleged use of ICAs, consideration should also be given to identification and verification of related means of delivery and dissemination of such agents.

(B) MONITOR DEVELOPMENTS IN SCIENCE AND TECHNOLOGY APPLICABLE TO ICAs AND THEIR MEANS OF DELIVERY

The Director General, in his “Response” to the SAB Report, informed the Third Review Conference that the “*Secretariat will continue to monitor developments relating to unscheduled and novel toxic chemicals and will explore ways in which to augment its technical capabilities in this area.*”<sup>249</sup> He further informed the Conference that the Secretariat “*will seek advice from the SAB on the feasibility of establishing a systemic approach to tracking and evaluating advances in science and technology, given the pace at which these advances are occurring.*”<sup>250</sup> Subsequently, in his Note to the October 2013 Executive Council, the Director General highlighted the potential utility of employing “*technology monitoring and horizon scanning (a technique for detecting early signs of potentially important advances).*”<sup>251</sup>

These monitoring activities come under the sole responsibility and competency of the Director General and the Technical Secretariat and require no further agreement from any PMO. Consequently such measures can be taken forward by relevant Technical Secretariat staff in consultation and coordination with the SAB, as appropriate, and initial activities in this area have already taken place<sup>252</sup>. Given the long-standing and widespread concern voiced by scientific and arms control organisations, the SAB and a number of State Parties that certain advances in S&T may be employed for the development of ICAs or related means of delivery, it would be appropriate for such technologies to be included within the scope of the Secretariat’s monitoring mechanisms.

246 OPCW, Conference of the States Parties, Note by the Director-General, Response to the Report of the Scientific Advisory Board on Developments in Science and Technology for the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, Third Review Conference RC-3/DG.2, 8<sup>th</sup> – 19<sup>th</sup> April 2013 31<sup>st</sup> January 2013, paragraph 15.

247 Some related activities may require further consultation with and/or agreement by relevant policy making organs. For example, the inclusion of new data on non-scheduled chemicals to OCAD must first be submitted to the OPCW Validation Group and following their recommendation, submitted by the Director General to the Executive Council for their consideration and approval.

248 A Temporary Working Group on Verification was established by the Director General and held its first meeting on 19<sup>th</sup> – 20<sup>th</sup> March 2013. For minutes of the first meeting together with the TWG’s terms of reference see: OPCW, Scientific Advisory Board, Twentieth Session (14<sup>th</sup> June 2013) *op.cit.*, Annex 3.

249 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, *op.cit.* 31<sup>st</sup> January 2013, paragraph 9.

250 OPCW, Conference of the States Parties, Note by the Director-General, Response to the SAB Report, *op.cit.* 31<sup>st</sup> January 2013, paragraph 29.

251 OPCW, Note by the Director General, EC-74/DG.1 (24<sup>th</sup> July 2013) *op.cit.*, paragraph 5.

252 OPCW, Scientific Advisory Board, Twentieth Session (14<sup>th</sup> June 2013) *op.cit.*, Subitem 7(c): Monitoring developments in science and technology, paragraphs 7.10 – 7.14.

(C) EXPLORE THE IMPLICATIONS OF CONVERGENCE IN THE LIFE AND CHEMICAL SCIENCES FOR THE DEVELOPMENT OF ICAs AND RELATED MEANS OF DELIVERY

The convergence of the life and chemical sciences and the potential implications for the implementation of the CWC are clearly significant issues that will impact upon the Organisation for the foreseeable future. Given concerns raised by scientific organisations and a number of CWC State Parties and BTWC States Parties that certain advances and convergences in the life and chemical sciences may be employed for the development of mid-spectrum agents including bio-regulators and toxins as ICAs, it would be appropriate for such technologies and activities to be included within the scope of the Secretariat's on-going review of the implications of convergence. The Technical Secretariat should also give consideration to reviewing the implication of advances in related technologies (e.g. nanotechnology) that could facilitate dissemination and uptake of ICAs.

In 2011 a SAB Temporary Working Group on the convergence of chemistry and biology was established and held its first meeting in November 2011<sup>253</sup>. It included experts from the life sciences and the biotechnological industry, and was requested by the Director General to specifically explore this convergence and the potential implications for the implementation of the Chemical Weapons Convention. To date it has held three meetings and is due to prepare a report of its findings in 2014.<sup>254</sup> Given its terms of reference,<sup>255</sup> it would be appropriate if considerations regarding ICAs and related means of delivery were included within its findings and recommendations.

In addition, and building on existing initiatives, the Director General, Technical Secretariat and the SAB should seek to improve and strengthen coordination with the Implementation Support Unit (ISU) for the BTWC so as to address the implications to both the CWC and BTWC of the convergence of the life and chemical sciences and technologies, including with respect to the development of ICAs and related means of delivery.

### 7.3 RECOMMENDATIONS FOR CIVIL SOCIETY, SCIENTIFIC AND ACADEMIC COMMUNITIES

Over the last ten years, a range of respected national and international non-governmental scientific organisations, including the Royal Society, the US National Academy of Sciences, Pugwash and the International Union of Pure and Applied Chemists, has provided the OPCW and its Member States with well-documented independent research and analysis detailing relevant scientific and technological advances that could be employed in the development of ICAs and related means of

253 OPCW, OPCW Hosts Series of Science and Technology Meetings, 28<sup>th</sup> November 2011, <http://www.opcw.org/news/article/opcw-hosts-series-of-science-and-technology-meetings/> (accessed 1<sup>st</sup> October 2013).

254 Reports of the three TWG meetings are appended to the following reports: OPCW, Report of the Seventeenth Session of the Scientific Advisory Board, SAB-17/1, 21<sup>st</sup> – 23<sup>rd</sup> November 2011, 23<sup>rd</sup> November 2011; OPCW, Report of the Nineteenth Session of the Scientific Advisory Board, SAB-19/1, 10<sup>th</sup> – 12<sup>th</sup> September 2012, 12<sup>th</sup> September 2012; OPCW, Report of the Twentieth Session of the Scientific Advisory Board SAB-20/1, 10<sup>th</sup> – 14<sup>th</sup> June 2013, 14<sup>th</sup> June 2013.

255 Amongst the issues the TWG has been considering, *inter alia*, are: “*application of biologically mediated processes for the synthesis/production of toxins and bioregulators, and future trends...chemical synthesis of agents of biological origin (e.g. toxins, bioregulators) and of replicating systems... whether any biotechnological processes exist, other than biologically mediated synthesis, that are of relevance to the implementation of the CWC... whether there are other scientific disciplines, apart from biology, that are converging in a significant way with chemistry, and whether it is possible to identify triggers or early-warning indicators for potential game-changing events that might have implications (whether positive or negative) for the CWC.*” See: OPCW, Temporary Working Group on the Convergence of Chemistry and Biology, Terms of Reference (revised), 22<sup>nd</sup> June 2012. Appendix 2 of OPCW SAB (12<sup>th</sup> September 2012) *op.cit.*

delivery, highlighting the potential implications of such development and proliferation. Given the current discourse within the OPCW on ICAs, it is important that the non-governmental scientific community continue to be actively engaged on this issue, and specifically should:

(A) MONITOR DEVELOPMENTS IN SCIENCE AND TECHNOLOGY RELATED TO ICAs AND THEIR MEANS OF DELIVERY AND HIGHLIGHT ATTEMPTS TO HARNESS SUCH DEVELOPMENTS IN WEAPONS PROGRAMMES

Building on previous work, independent scientific bodies should engage in technology monitoring and S&T horizon-scanning so as identify technologies and activities of potential concern, specifically highlighting existing research and development of ICAs and related means of delivery conducted by State entities or other actors; and predict likely research trajectories in relevant scientific disciplines and associated technologies, highlighting potential application for weapons development programmes.

(B) ENGAGE WITH THE OPCW, THE BTWC STATES PARTIES AND BTWC IMPLEMENTATION SUPPORT UNIT (ISU)

Independent scientific bodies should continue to constructively engage with the relevant PMOs and subsidiary bodies of the OPCW, and the BTWC States Parties and BTWC ISU to highlight existing limitations in the CWC, BTWC and attendant control regimes with regard to ICAs and related means of delivery, and to develop and promote possible science-informed policy responses.

(C) CONDUCT EDUCATION AND AWARENESS-RAISING AMONGST THE LIFE AND CHEMICAL SCIENCE COMMUNITIES

National and international professional scientific associations should explore activities to nurture a culture of responsibility amongst the greater scientific community, highlighting the potential threats arising from the application of dual-use technologies, including those for ICA development, and the consequent requirement for appropriate oversight of such research. In addition, existing activities to develop and promote professional oaths, codes and pledges and the parallel processes of education and awareness-raising amongst the life science, chemical and biomedical communities should incorporate the dangers arising from the development, proliferation and misuse of ICAs and related means of delivery.