

Fraying at the seams? Chemical and biological weapons on the margins

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The Chemical and biological weapons (CBW) regime, through the 1972 Biological and Toxin Weapons Convention and the and the 1993 Chemical Weapons Convention, appears to have established sound definitions for what constitutes a biological and chemical weapon which clearly delineate permitted from prohibited forms of violence. Moreover, for the large part of the history of these Conventions such definitions have served the international community well. However, at the peripheries of these agreements, qualitative and quantitative ambiguities over what constitute chemical and biological weapons remain. This paper looks at how such ambiguities could, over time, unravel shared understandings of what constitutes a chemical or biological weapon and, therefore, potentially begin to fray the CBW regime at the seams.

This paper draws of elements of a much broader ESRC funded research project on science and security led by Professor Mary Kaldor at LSE.¹ The purpose of this paper is to look at a number of selected cases of chemical or biological weapons that remain on the margins of the regime. These are dealt with in two categories: qualitative and quantitative. The former, qualitative category looks at specific means and methods of warfare that can be considered on the margins and includes entomological warfare (specifically infestation); biological anti-materiel agents; “biocontrols”; white phosphorus; malodorants and instruments of acid violence. The latter quantitative category looks at the use of lethal – yet not ‘mass destructive’ - chemical weapons that, for one reason or another, appear to have received comparatively scant attention from the international community. Examples here include the use of chlorine barrel bombs and other chemical weapons intended, seemingly for purposes of localized terrorization. Notably, excluded here – to avoid duplication - is the very real issue of incapacitating and riot control agents, an topic which has been dealt with at depth by several scholars,² including *inter alia*, McLeish,³ Perry-Robinson⁴, Davison,⁵ Dando & Crawley.⁶

¹ This is a small part of a project funded by the UK Economic and Social Research Council (ESRC)/Dstl Science and Security Programme on the ‘Strategic Governance of Science and Technology Pathways to Security’ [ES/K011324/1] that was awarded jointly to the London School of Economics and Science Policy Research Unit, University of Sussex.

² ICRC. 2012. “Report of an Expert Meeting. ‘Incapacitating Chemical Agents’: Law Enforcement, Human Rights Law and Policy Perspectives.” In . <http://www.icrc.org/eng/assets/files/publications/icrc-002-4121.pdf>.

³ Caitriona McLeish and J P Perry Robinson, “Candidate Agent TL2636: A Cautionary Tale for the General Purpose Criterion”, a paper presented at the 15th workshop of the Pugwash Study Group on Implementation of the CBW Conventions, Approaching the First CWC Review Conference, Oegstgeest, the Netherlands 23-24 June 2001.

⁴ Robinson, J P Perry. 1995. “The Chemical Weapons of Desert Storm Forces and the Wider Implications of Tear Gas and Other Incapacitants.” In *The 2nd Gulf War and the CBW Threat: Proceedings of the 3rd Annual Conference on*

The paper begins with an overview of the scope of the CBW regime and some of the assumptions that appear to have informed – and continue to inform - definitions of what constitute CBW. The paper then discusses a series of case studies – beginning with qualitative and then proceeding to quantitative ones – that can be considered as being on the margins, before turning to the implications of such case studies for the sustainability of the CBW regime in the 21st century. The paper concludes that the qualitative cases addressed have had limited implications for the regime or international security; however the relative inattention to smaller-scale uses of chemical weapons, such as chlorine-barrel-bombs, raises questions over the ongoing health of the regime and the future prospects for a world free of chemical and biological weapons.

Scope of the CBW regime

The hostile use of poison in war has long been met with obloquy, with history providing a number of examples, in a number of different cultures, of statements from eminent individuals declaring the use of poison as somehow beyond the pale.⁷ Over time, such statements became codified through arms control and disarmament agreements, such as The Hague Convention (1899) the Geneva Protocol (1925) and, later still, the Biological and Toxin Weapons Convention (1972) and the Chemical Weapons Convention (1993). With all these agreements, a number of events, interests and other contingent factors have shaped understandings and assumptions as to what practices are prohibited and what methods of warfare are outside of the scope of these agreement, and thereby permitted. Determining the scope and balancing the interests of stakeholders often takes a significant amount of time, with the process of “captur[ing] meaning with precision”⁸ a slippery task; something compounded in treaties of an unlimited duration by the fact that changes in technology and security can alter assumptions and interests pertaining to the scope of the regime.

For example, in the case of The Hague Convention, under part IV States Parties “agree to abstain from the use of projectiles the object of which is the diffusion of asphyxiating or deleterious gases”. Such a statement may have made sense with the technology of the time; however, following the exploitation of chlorine cylinders to ‘weaponise the wind’⁹ in 1915 (a development facilitated by the then advanced German chemical

Chemical Warfare [Brussels, 29-30 November 1991], edited by Jean-Pascal Zanders, a special :pp 83–95. Brussels: Interfacultair Overlegorgaan voor Vredesonderzoek van de Vrije Universiteit Brussel.

⁵ Davison, Neil. 2006. “The Early History of ‘Non-Lethal’ Weapons.” Bradford: University of Bradford.

⁶ Dando, Malcolm, and Michael Crowley. 2014. “The Incapacitating Chemical Agents Loophole.” *The Bulletin of the Atomic Scientists* 22 October.

⁷ Zanders, Jean Pascal. 2003. “International Norms against Chemical and Biological Warfare: An Ambiguous Legacy.” *Journal of Conflict and Security Law* vol 8 (no 2): pp 39–410.

⁸ Chayes, Abram, and Antonia Handler Chayes. 2009. *On Compliance. International Organization*. Vol. 47. doi:10.1017/S0020818300027910. http://www.journals.cambridge.org/abstract_S0020818300027910.

⁹ See Robinson chapter in Revill, James, Caitríona Mcleish, and Julian Perry Robinson. 2015. “Case Study on Chemical/Biological Weapons, SPRU/LSE Project on Strategic Governance of Science and Technology: Pathways to Security Case.” Forthcoming.

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industry), several allied states accused Germany of violating its commitment under the Hague Convention, something raised in a “spirited protest” by Lord Kitchener in the House of Lords and tied to British propaganda.¹⁰ Technically however, through weaponising the wind rather than the use of projectiles, Germany had indeed abstained “from the use of projectiles the object of which is the diffusion of asphyxiating or deleterious gases”.¹¹

For all its on-going value, the 1925 Geneva Protocol, which prohibited the “use in war of asphyxiating, poisonous or other gases, and of all analogous liquids materials or devices ... [and] ... the use of bacteriological methods of warfare”,¹² suffered from a number of weaknesses. Firstly, it only prohibited *the use* of such weapons in warfare and, arguably, only between the High Contracting Parties. Secondly, the limited definition of coverage enabled some states to challenge the scope of the Protocol. This problem of interpretation was particularly acute in relation to the legality of tear gas; herbicides (i.e. Agent Orange);¹³ and the ambiguity of biological weapons other than ‘bacteria’, such as viruses, fungi, rickettsia and toxins.¹⁴ Tear gas proved particularly divisive following the large-scale use of the agent in Vietnam. Whereas the US suggested tear gas had “nothing to do with gas warfare which was waged with deadly poisonous gas”¹⁵ the Soviet Union condemned this as “a crime against humanity” and a “flagrant act of lawlessness”,¹⁶ and seized upon the US use of tear gas in propaganda campaigns during the Cold War.¹⁷

These two examples illustrate how the defining a category of weapons is more than a matter of nomenclature and technical definitions, but a political process which is ‘bound up with the distribution of social authority’, power and interests.¹⁸ Moreover, such

¹⁰ See The New York Times (1915) “Kitchener Scores German Cruelty” April 28, 1915

<http://query.nytimes.com/mem/archive-free/pdf?res=F3091EFF3E5A15738DDDA10A94DC405B858DF1D3> see also Lefebure, V. (1922). *The Riddle of the Rhine*. London and Glasgow: Collins.

¹¹ Harris and Jeremy Paxman, R. (2002). *A Higher Form of Killing: The Secret History of Chemical and Biological Warfare* (p. 300 pp [updated from 1982 edition]). London: Arrow Books. Pg. 5/

¹² League of Nations (1925) “*Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare.*” Geneva, 17 June 1925.

¹³ Examples of herbicides notably include the biochemical regulators used in Vietnam. See Boserup. A (1973) “*CBW and the Law of War*”, The Problem of Chemical and Biological Warfare, Stockholm International Peace Research Institute (SIPRI) study volume III, Paul Elek Limited, London. pg, 43

¹⁴ As the UK delegation to the Conference of the Eighteen-Nation Committee on Disarmament later noted, “[...]the term “bacteriological” as used in the Protocol is not sufficiently comprehensive to include the whole range of possible biological agents of warfare.” UK (1968) “*Final verbatim record of the Conference of the Eighteen-Nation Committee on Disarmament*”, Meeting 387, 6th August 1968. <http://www.hti.umich.edu/cgi/t/text/text-idx?c=endc;cc=endc;rgn=main;view=text;idno=4918260.0387.001>

¹⁵ Goldblatt. J (1971) *Ibid*, pg, 237.

¹⁶ Goldblatt. J (1971) “*CB disarmament Negotiations 1920-1970*”, ‘The Problems of Chemical and Biological Warfare’, Stockholm International Peace Research Institute (SIPRI) study, Volume IV, New York, Humanities Press. pg, 237.

¹⁷ An article in the New York Times stated, “The Asian Communists have begun a propaganda campaign to exploit the disclosure that gas has been used against the Vietcong in South Vietnam”. The New York Times (1965) “Asian Reds Make Gas a Top Issue; Propaganda Drive Believed Effective Though Belated”, ‘*New York Times*’ New York, N.Y.: Mar 25, 1965. pg, 14, 1 pgs

¹⁸ Rappert, Brian. 2013. *Controlling the Weapons of War: Politics, Persuasion, and the Prohibition of Inhumanity*. Routledge. Pg 58

definitions, despite being explicitly fixed in treaty language are nevertheless shaped by the evolving scientific and political milieu.

Biological weapons at the margins

The Biological and Toxin Weapons Convention opened for signature in 1972. The scope of the Convention is embodied in Article I, in which states agree

“... never in any circumstances to develop, produce, stockpile or otherwise acquire or retain:

- 1. microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;*
- 2. weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.”*

The broad scope of the Convention – and the avoidance of a list based approach to determining the limits of the agreement - arguably instils the agreement with a timeless quality and indeed subsequent Review Conferences have reaffirmed that that Article I applies to all scientific and technological developments in the life sciences and in other fields of science relevant to the Convention¹⁹; a solution that, Sims suggested, “[...] had an elegant simplicity. It encompassed nanotechnology without singling it out (which might have provoked disagreement) for special mention”.²⁰

Nevertheless, at the margins of the BWC there lie several possible methods of warfare, which are ambiguous and have the potential to fragment perceptions of the scope of the Convention and divide States Parties’ understandings of what constitutes a biological weapon. Such examples include, *inter alia*, entomological *infestation* (as opposed to the use of insect vectors *to infect*), anti-materiel biological weapons and so-called “biocontrols” that is anti-crop weapons targeted at illegal drug crops.

Entomological infestation

The use of insects as vectors for the deliberate transmission of disease has been explored as a method of biological warfare by several states, but most notably in the offensive biological program of the Japanese during World War Two.²¹ Such deliberate acts of entomologically mediated infection are widely considered to be covered by the BWC;²² however, the status of entomological *infestation* is less clear. Indeed, divisions

¹⁹ UN (2006) “*Final Document of the Sixth Review Conference*”, BWC/CONF.VI/6, Sixth Review Conference: 20 November - 8 December, 2006, Geneva. http://www.opbw.org/rev_cons/6rc/docs/6/BWC_CONF.VI_6_EN.pdf pg, 9.

²⁰ Sims. N (2009) “*The Future of Biological Disarmament*”, Routledge International Studies, Abingdon, Oxon. pg, 54.

²¹ See Williams. P & Wallace. D (1989) “*Unit 731: Japanese Army's Secret of Secrets*”, London, Hodder & Stoughton Ltd; Harris. S. B (1994) “*Factories of Death*”, London, Routledge

²² Zanders, Jean-Pascal. 2015. “No Humanitarian Justification for Biological Weapons.” *The Trench*. <http://www.the-trench.org/no-humanitarian-justification-for-bw/>.

between states over entomological infestation emerged with regard to the largely discredited Cuban allegation of US “biological aggression” over Cuban soil that was submitted to the UN Secretary-General on the 28th of April 1997.²³ Although the allegation was dismissed by most states, the question of whether the use of insects to *infest* rather than as vectors to infect, proved divisive and Sims notes “Denmark and the Netherlands expressed doubt, which other parties are known to have shared, over the question of whether insects or other pests such as *Thrips palmi* fall within the scope of the BWC”.²⁴

In the original 1969 UK Draft Convention, insects for the purposes of infestation were arguably taken into consideration and the definition, which was later rejected, was seemingly intended to cover, “crop-destroying insects such as locusts or Colorado beetles”.²⁵ However, the subsequent text that emerged remained mute on the issue of infestation, resulting in a degree of ambiguity on this route of causing harm. Sim’s statement on this topic is worth quoting at length:

Some claim that the agents of infestation were understood not to be covered by Article I as it was finally negotiated. However it is hard to see how the actual text of Article I conveys this understanding [...] The method of waging war was no longer specified, and thus it can only be assumed that actions preparatory to both infection and infestation are prohibited. But is silence a sufficient basis for this assumption?²⁶

Although some commentators have suggested infestation is covered,²⁷ it remains a somewhat grey area, which could potentially contribute to future rancour over the

²³ Cuba submitted the allegation to the Secretary General on the 28th of April 1997, claiming an exceptional infestation of the Cuban potato crop was the result of the US infecting Cuban soil with the *Thrips palmi* insect. Following the allegation, three sessions were allocated for the US and Cuba to make their case and based on the evidence presented, the majority of states conceded there was insufficient evidence to support the Cuban case, whilst China and North Korean evaluations provided support for the Cuban claims. See: Meselson. M & Perry-Robinson. J [eds] (1997) “News Chronology: May-August 1997”, *Chemical and Biological Weapons Conventions Bulletin*, Issue no 37, September 1997. <http://www.sussex.ac.uk/Units/spru/hsp/documents/cbwcb37.pdf>; Zilinskas. R (1999) “Cuban Allegations of Biological Warfare By the United States: Assessing the Evidence,” *Critical Reviews in Microbiology*, Volume 25, number 3, 1999. pgs 173-228.

²⁴ Sims. N (2001) “*The Evolution of Biological Disarmament*”, SIPRI, Chemical & Biological Warfare Studies Number 19, SIPRI, Stockholm. pg, 45.

²⁵ Ambassador Mulley in his introduction of the UK draft in 1969 was explicit in this regard, stating “[i]t is possible to envisage the use in war of biological agents which are not microbes: hookworm, for instance [...] or even crop-destroying insects such as locust or Colorado beetles. We have therefore tried to find a definition which covers all possible agents” See UK IN: UN (1969) “*Final verbatim record of the Conference of the Eighteen-Nation Committee on Disarmament [Meeting 418]*”, 10 July 1969, Ann Arbor, Michigan: University of Michigan Library. <http://www.hti.umich.edu/cgi/t/text/text-idx?c=endc;cc=endc;view=toc;idno=4918260.0418.00> pg, 9.

²⁶ Sims. N (2009) “*The Future of Biological Disarmament*”, Routledge International Studies, Abingdon, Oxon. pg, 41.

²⁷ Certainly Dr J. P. Zanders has suggested the BWC “appears to apply to entomological warfare (insect vectors)”. See Zanders. J. P (2004) “*Research Policies, BW Development & Disarmament*”, Presentation to Conference on ‘Ethical Implications of Scientific Research on Bioweapons and Prevention of Bioterrorism European Commission, DG Research, Brussels, 4 February 2004.

scope of the Convention, particularly in the event a suspicious case of infestation occurred in a highly volatile region.²⁸

Anti-materiel agents

A second research sphere that has the potential to provoke division in the thinking of States Parties *vis-à-vis* the BWC is that of biological anti-materiel agents. There exist a myriad of microorganisms that naturally degrade or alter inorganic materiel; and advances in science are enabling greater understanding and relatively greater control over such agents. Such a development could have significant implications in, for example, tackling natural disasters, such as oil spills.²⁹ However, such advances also have potentially hostile applications³⁰ with the capability to expedite the corrosion, fouling, rotting or decaying etc.³¹ of inanimate objects clearly offering great potential for militaries seeking to weaken an enemy by targeting resources such as fuel, vehicles or weapons lubricants.³²

Because anti-materiel biological weapons are not intended to be harmful to humans, animal or plants *per se*, some commentators have already suggested that such weapons are outside of the scope of the BWC's General Purpose Criterion.³³ Such claims are, however difficult to determine with any degree of certainty. Moreover, although directed towards affecting materiel, the application of an agent used to degrade or corrode could have a broader affect on the surrounding environment and organisms within it. Context matters in this regard and it is important to emphasise that should a biological agent targeted at materiel indirectly affect human animal or plant life there is every possibility that it could be argued to be biological weapon – particularly in the propaganda wars of the 21st century³⁴ - and hence both prohibited and condemned. At the very least such an eventuality could generate a highly politicised debate, which has

²⁸ Whilst remote, is not inconceivable that infestation could be employed as a weapon under certain conditions. For instance consider the implications of Indian infestation of Pakistani cotton crop, which accounts for a significant chunk of Pakistan's Gross Domestic Profit. See Kadlec. R. P (1995) "Biological Weapons for Waging Economic Warfare", *Battlefield of the Future, 21st Century Warfare Issues*, September 1995. <http://www.airpower.maxwell.af.mil/airchronicles/battle/bftoc.html>

²⁹ Dellagnezze, Bruna Martins, Gabriel Vasconcelos de Sousa, Laercio Lopes Martins, Daniela Ferreira Domingos, Elmer E G Limache, Suzan Pantaroto de Vasconcellos, Georgiana Feitosa da Cruz, and Valéria Maia de Oliveira. 2014. "Bioremediation Potential of Microorganisms Derived from Petroleum Reservoirs." *Marine Pollution Bulletin* 89 (1-2): 191–200. doi:10.1016/j.marpolbul.2014.10.003. <http://dx.doi.org/10.1016/j.marpolbul.2014.10.003>.

³⁰ See for example the Official Journal of the International Biodeterioration and Biodegradation Society. Details are available from: http://www.elsevier.com/wps/find/journaldescription.cws_home/405899/description#description

³¹ See the International Biodeterioration and Biodegradation, The Official Journal of the International Biodeterioration and Biodegradation Society. Details are available from:

http://www.elsevier.com/wps/find/journaldescription.cws_home/405899/description#description

³² The Sunshine Project (2002) "Non-Lethal Weapons Research in the US: Genetically Engineered Anti-Material Weapons", The Sunshine Project Backgrounder Series #9, March 2002.

<http://www.sunshine-project.de/infos/aktuelles/antimateriel/bk9%20antimateriel%20microbes.pdf>

³³ Certainly academics such as J.P. Zanders have suggested the Convention "does not cover anti-materiel biological agents". Zanders. J. P (2004) "Research Policies, BW Development & Disarmament", Presentation to Conference on 'Ethical Implications of Scientific Research on Bioweapons and Prevention of Bioterrorism European Commission, DG Research, Brussels, 4 February 2004.

³⁴ Cockburn, Patrick. 2015. *The Rise of Islamic State*. Verso.

the potential to engender divergence on the scope of the Convention and, by implication, a divergence amongst States Parties over what constitutes non-compliance and indeed what constitutes a biological weapon.

Biocontrols

A third case study is that of so-called “biocontrols”. At the Fifth Review Conference in 2001, the topic of anti-plant warfare was raised by the delegation of South Africa who stated that biocontrol “activities require closer scrutiny and control as the distinction between the peaceful use of biocontrol agents [...] and their use as BW is less clear and the dual use nature of these agents is much more relevant”.³⁵ The Fifth Review Conference failed to produce a set of Agreed Understandings. Moreover even should there have been a degree of consensus amongst States Parties that the BWC prohibits the use of anti-plant weapons against legal agricultural production, agreement on ‘biocontrols’ designed to eradicate illegal drug crops is likely to be a more complex issue.

Indeed, two agents appear to have already been taken forward in this regard: *Fusarium oxysporum* and *Pleospora papaveracea*, both of which “are toxic molds that attack their targets (“hosts”) through the secretion of cell-dissolving chemicals called mycotoxins”.³⁶ *Fusarium oxysporum*, was initially considered for use in Florida as part of a domestic campaign to deal with the Marijuana crop. However, its “reputation for mutating” combined with the “environmental effects” of the agent meant the programme was cancelled.³⁷ *Pleospora papaveracea*, is reported to have been used by British and US forces as a means to cause leaf blight in opium poppies in order “to hamper the opium production and trade that is essential for the continued Taliban insurgency in the region”.³⁸

The latter case remains unsubstantiated; however, even if proven, there remains a not unreasonable line of argument that using *Pleospora papaveracea* against illegal drug crops has a protective or peaceful purpose, and such would be permitted under the BWC. Nevertheless the use of such biocontrols does generate philosophical questions in relation to peace and protection for whom?

³⁵ UN (2001) “Background Paper on New Scientific and Technological Developments Relevant to the Convention”, BWC/CONF.V/4, 14 September 2001, Fifth Review Conference, Geneva.

http://www.opbw.org/rev_cons/5rc/docs/rev_con_docs/i_docs/V-04.pdf pg, 7.

³⁶ TNI (2007) “Evaluating Mycoherbicides for Illicit Drug Crop Control: Rigorous Scientific Scrutiny is Crucial”, Transnational Institute (TNI), Washington, D.C. February 27, 2007.

<http://www.tni.org/docs/200705111419584743.pdf> pg, 3.

³⁷ It was reported that some strains “cause deadly infections in humans, others can damage eyes” TNI (2007) *Ibid*, pg, 4.

³⁸ See SIPRI Yearbook 2010, p. 403.

Chemical weapons at the margins³⁹

The 1993 Chemical Weapons Convention (CWC) is broad in its scope with the General Purpose Criterion (GPC) producing an objective toxicity-bound definition of chemical weapons which effectively by-passes lists of banned or permitted substances and instead focuses instead on intent. Put otherwise it prohibits certain uses of chemicals, rather than chemicals *per se*. The CWC, unlike the BWC, contains exceptions, specifically it explicitly permits the use of certain chemicals for “law enforcement including domestic riot control purposes” something discussed at length by the authors identified above.

However, beyond law enforcement, there are several cases where it seems the use of chemicals as weapons is frequently *not* seen as the use of chemical weapons. Three examples are identified below: White Phosphorus, Malodorants and Acid Violence.

White Phosphorus

White Phosphorus has a long history as a weapon⁴⁰ with the substance considered “as filler for incendiary projectiles in the Crimea war 1854”.⁴¹ During the First World War it was widely used by both sides with a number of battlefield functions, including as a tracer, a substance for generating smoke screens, as a psychological tool and a “means of producing casualties on the battle field.”⁴²⁴³ It was, by most accounts, seen as a chemical weapon and recorded as such in the US and UK literature during the inter-war years.⁴⁴

By the time of the Second World War, WP was recognised as a valuable anti-personnel tool, with the British reportedly procuring some 16,000 tons over the course of the conflict.⁴⁵ However for States Parties to the Geneva Protocol it was weapon which was problematic with the British concerned that the use of WP as a anti personel weapon could be seen as contravening the 1925 agreement and giving “the enemy a reasonable pretext for initiating gas warfare against our forces”.⁴⁶ Yet rather than prohibit the use of White Phosphorus, its use the battlefield against enemy personnel was allowed by

³⁹ This section is adapted from a chapter in: Revill, James, Cairiona Mcleish, and Julian Perry Robinson. 2015. “Case Study on Chemical/Biological Weapons, SPRU/LSE Project on Strategic Governance of Science and Technology: Pathways to Security Case.” Forthcoming.

⁴⁰ Koch, E. C. (2008) “Special Materials in Pyrotechnics: V. Military Applications of Phosphorus and its Compounds”. *Propellants, Explosives, Pyrotechnics*, 33(3), 165–176. doi:10.1002/prop.200700212

⁴¹ Ibid

⁴² West, C., & Fries, A. (1921) “*Chemical Warfare*”. New York: McGraw-Hill Book Company, Inc. pg 101

⁴³ Kleber, B. E., & Birdsell, D. (1966) “The Chemical Warfare Service: Chemicals in combat”, Washington, D. C.: Office of the chief of military history, United States Army.

⁴⁴ Tuorinsky, S. D. [ed] (2008) “Medical Aspects of Chemical Warfare”. Government Printing Office.

⁴⁵ Brophy, P. L., Miles, W. D., & R. C Cochrane. (1959) “The Chemical Warfare Service: From Laboratory to Field”, Washington, D. C. Office of the Chief of Military History, Department of the US Army. pg 405.

⁴⁶ War Cabinet Office (1944) “Chiefs of Staff Committee consider use of white phosphorus”, 1 June 1944, TNA, FO 954/18A/146. Annex II, pg. 149.

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the British, with the caveat that all references to the specific use of WP as an anti-personnel weapon be removed.⁴⁷

White Phosphorus has subsequently been employed in a number of other conflicts Guinea,⁴⁸ the Falklands,⁴⁹ the Korean War,⁵⁰ Vietnam,^{51,52} Bosnia, the Caucasus, Iraq and Gaza. Yet despite being identified as a chemical weapon in the past it largely remains on the margins of the Chemical Weapons Convention. As a spokesperson for the Organization for the Prohibition on Chemical Weapons stated in 2005, White Phosphorus is “not forbidden by the CWC if it is used within the context of a military application which does not require or does not intend to use the toxic properties of white phosphorus”; however, as he added “If on the other hand the toxic properties of white phosphorus, the caustic properties, are specifically intended to be used as a weapon, that of course is prohibited.”⁵³

Malodorants

The hostile exploitation of odour in war dates back to antiquity, however, it was not until the interwar years malodorants were subjected to more scientific research.⁵⁴ By the Second World War, the use of malodorants became a reality with official documents indicating that Allied forces were instructed to employ foul-smelling, Pyridine based materials in desert warfare operations designed to render water undrinkable. In contrast with the evident concerns over the legality of WP, it was argued that such weapons were not toxic per se and as such an acceptable form of warfare.⁵⁵ In the US, during WWII, malodorants were taken a step further, with a project designed to produce material that emitted a “fecal odor” developed to cause derision of German forces. The “who me” maloderant device that emerged was discarded when it was realised that “people in many areas of the world do not find ‘fecal odor’ to be offensive”.⁵⁶ Nevertheless interest in maloderants continued over the course of the Cold War, albeit increasingly in a law enforcement context where maloderants offered one means of controlling crowds.⁵⁷ Notably interest continue into the 21st century,⁵⁸ with

⁴⁷ War Cabinet Office (1944) *ibid*

⁴⁸ UN Security Council (1969) “*Report of the Security Council*”, 16 July 1968-15 July 1969. Pg 97

⁴⁹ Rayment, S (2005) “Tim Collins Trained Troops to Fight with White Phosphorus”, *Sunday Telegraph* (London), Nov. 20, 2005

⁵⁰ See variously: Sandler, S. (1999) “*The Korean War: No Victors, No Vanquished*”, University Press of Kentucky. Pg. 80; Neilands, J. B. (1973) “Survey of chemical and related weapons of war”, *Die Naturwissenschaften*, 60 (4), 177–83.

⁵¹ Rottman, G. (2012) “*Vietnam Riverine Craft 1962-75*”. Osprey Publishing.

⁵² Mangold, T., & Pencyate, J. (2012). “The Tunnels of Cu Chi: A Remarkable Story of War” Hachette UK, pg 112;

⁵³ Peter Kaiser as cited in Reynolds. P (2005) “White phosphorus: weapon on the edge”, *BBC news*, 16 November 2005.

⁵⁴ **DOCUMENT ON ORDER FROM PRO**

⁵⁵ War Cabinet (1940) “*The Middle East Directive to the Commander in Chief*”, W.P. (40) 330. August 22, 1940. Annex I, Note on Method of Dealing with Drinking Water <http://filestore.nationalarchives.gov.uk/pdfs/small/cab-66-11-wp-40-330-10.pdf>

⁵⁶ US Army (1997) “*Odorous Substances*” [redacted]. Research Proposal, July 1997. Aberdeen Proving Ground, MD: US Army Edgewood Research, Development, and Engineering Center.

⁵⁷ Security Planning Corporation (1972) “*Non-Lethal Weapons for Law Enforcement: Research Needs and Priorities*”. A Report to the National Science Foundation. Washington, DC; Witten, B., Wagman, W., Saffer, R., and Cohen, I., (1970) “*Malodorous substances as riot control and training agents*”, Edgewood Arsenal Technical Report Series Number

maloderants reportedly being used by both state⁵⁹ and non state actors (ranging from “pro-life” activists to anti-whaling protestors).⁶⁰

Instruments of Acid Violence

Acid violence, that is the deliberate use of acid to hurt another human being, has a long history⁶¹ and, whilst it is not a new problem, it is a continuing cause of serious physical, psychological and sociological harm. Moreover, it is something which is not infrequent, with Acid Violence Survivors Trust International (ASTI) estimating that there are “as many as 1500 recorded attacks a year” around the world; although this is almost certainly an understatement because of limitations in both data and voice of the victims.

As a hostile use of chemicals that is both seemingly frequent and harmful, one might assume that the malevolent use of acid in this fashion constitutes a chemical weapon in that acid attacks can exert a ‘chemical action on life processes’ causing death, or permanent harm. However this does not seem to be the case for several possible reasons. Firstly despite causing chemical burns⁶³ not dissimilar to those generated by white phosphorus,⁶⁴ “acid attacks rarely result in the ‘contamination of the body’ and destruction from within *per se*” and therefore perhaps fails to elicit the same level of obloquy as those acts more akin to poisoning.⁶⁵ Secondly, acid violence has limited utility as a militarily significant weapon, which, whilst not explicit in focus of the CWC, is seemingly important in thinking around chemical weapons. Thirdly, there is little that can be done internationally about domestic crimes, and as such there are perhaps “pragmatic grounds for the marginalisation of acid violence” in CWC related discourse.⁶⁶

A final possibility is that acid violence remains on the margins because those it affects are predominantly poor and voiceless young women in patriarchal societies whose lives are disconnected from those living and working the Hague? Whatever the reasons acid violence is arguably no less terrifying an ordeal for the victim; and, over the last decade,

4370, Department of the Army, Edgewood Arsenal, MD; and National Research Council of the National Academies. (2003) “*An Assessment of Non-Lethal Weapons Science and Technology*”. Pg. 107.

⁵⁸ National Research Council of the National Academies. (2003) “*An Assessment of Non-Lethal Weapons Science and Technology*”

⁵⁹ BBC (2008) “New Israeli weapon kicks up stink”, 2 Oct 08, BBC News Online

⁶⁰ CNN (2008) “Activist: attack on whalers ‘nonviolent chemical warfare’”, Tokyo, 3 Mar 08; Vidal. J (2008) “Man at the heart of the whale wars – eco-terrorist or green warrior?”, *The Observer* (London), 10 Jan 10.

⁶¹ The loyal reformers gazette Volume III, 1831. Pg. 332.

⁶² Mannan, A, S Ghani, SL Sen, A Clarke, and PEM Butler. 2004. “The Problem of Acid Violence in Bangladesh.” *The Journal of Surgery* 2 (1): 39–43.

⁶³ Eric R. Taylor (2001) “Lethal Mists: An Introduction to the Natural and Military Sciences of Chemical, Biological Warfare and Terrorism”, Nova Publishers, 1 Jan 2001.

⁶⁴ Eric R. Taylor (2001) “Lethal Mists: An Introduction to the Natural and Military Sciences of Chemical, Biological Warfare and Terrorism”, Nova Publishers, 1 Jan 2001.

⁶⁵ Revill, James, and Brett Edwards. 2015. “What Counts as the Hostile Use of Chemicals?” In *Absence in Science, Security and Policy*, edited by Brian Rappert and Brian Balmer, 1–237. Palgrave.

⁶⁶ Revill, James, and Brett Edwards. 2015. “What Counts as the Hostile Use of Chemicals?” In *Absence in Science, Security and Policy*, edited by Brian Rappert and Brian Balmer, 1–237. Palgrave.

no less devastating in its cumulative effect on casualties, nor any less a source of mass destruction in its aggregate effects on a scattered populace of AV victims. As such, whilst it is perhaps too much for the OPCW and the CWC to turn attention to acid violence, there is perhaps much that can be learned for the prevention of Acid Violence from the way dual use chemicals are dealt with under the CWC.

Quantitative factors

Whilst qualitative categories of CBW on the margins have the potential to be divisive; a greater concern in the fraying of the CBW regime is underwhelming response to the use of relatively small quantities of *lethal* chemical weapons in contemporary conflicts. This was certainly the case in Iraq where the regimes use of chemical weapons generated “ritualistic censure, but no serious effort at an international level to impose sanction”.⁶⁷ And so too this seems to be the case in Syria, where the localised use of chemical weapons, including more recently chlorine barrel bombs, appears to have been met with limited public outcry. There are perhaps good reasons for this, the use of chemical weapons in Syria represents such a small fraction of the on-going medley of atrocities that over attending to chemical weapons could reasonably be seen as disproportionate or myopic.

Nevertheless, the implicit inference in statements that the smaller scale use of chlorine “is not a WMD” and therefore, by implication, not a chemical weapon⁶⁸ is alarming. The Chemical Weapons Convention may well have been founded on Cold War assumptions of chemical warfare that focused on military significant types and quantities of agents;⁶⁹ however, the existence of lists and quantities of agent within the verification annex were never intended to supersede the toxicity bound prohibition on intent. Not all CBW are WMD, and the propagation of this argument is corrosive to the regime, suggesting as it does that there are acceptable uses of lethal chemical weapons, as long as fatalities are kept relatively low. Combined with the absence of any significant effort, as yet, to identify yet alone prosecute those responsible for the attacks in August 2013, which itself was a relatively small scale use of chemical weapons by Cold War standards, is there a case to be made that some forms of – comparatively small scale - chemical warfare can be conducted with impunity? And if so what does this mean for the CBW regime in the future.

⁶⁷ Falk, R (1990) *Inhibiting reliance on biological Weaponry*: IN: Wright, S. (1990). *Preventing a Biological Arms Race*. Cambridge, Mass: MIT Press. Pg 249

⁶⁸ Assad interview

⁶⁹ Something perhaps inferred in the illustrative lists of scheduled chemicals and the thresholds contained within the CWC Verification annex (part VI to VIII). For example the Regime for Schedule 1 Chemicals and Facilities Related to such Chemical within this annex states that: *A State Party shall not produce, acquire, retain, transfer or use Schedule 1 chemicals unless: (d) The aggregate amount for such purposes acquired by a State Party in any year through production, withdrawal from chemical weapons stocks and transfer is equal to or less than 1 tonne.*

Reflections

Both the BWC and the CWC have served the international community well, forming as they do a concrete manifestation of the longstanding norm against the use of chemical and biological weapons. We are better off for this regime and those that tend too it. Yet for all the success, there is a need to continue to tend the regime, to maintain it over time and in response to the evolving geostrategic context. This requires sustained commitment; as Brad Roberts has stated:

Tending to such implementation issues requires a steadiness of purpose not always found in governments and an ability to capture the attention of senior political figures even when they see few or no benefits to be reaped.”⁷⁰

For tenders of the regime, the qualitative and quantitative problem is not that these methods of warfare: the relatively small scale use of chemical weapons in Syria, acid violence, bio controls, white phosphorus, maloderants, anti materiel weapons and infestation, pose a overwhelming threat to international security in and of themselves. But that technological surprise, including from the shock of the old, in the form of new delivery systems and the changing nature of conflict, drawing a line between these seemingly accepted – or under-remarked - uses of biology and chemicals as weapons, and the prohibited use of biological and chemical weapons is not easy. In the context of war, particularly in prolonged, brutal conflicts in which moral baselines become eroded making this distinction becomes even more difficult. As Falk has stated “A sovereign state can make its own self-serving interpretation of international law obligations, especially during a war, and there is very little under most circumstances that can be done about it.”⁷¹ As such perhaps those at the forefront of tending the CBW regime and building a world free of chemical and biological weapons, might give some consideration as to what is in and what is out, to prevent a process of fraying the regime at the seams.

⁷⁰ Roberts, B. (1996). *Weapons Proliferation and World Order: After the Cold War*. Martinus Nijhoff Publishers.

⁷¹ Falk, R (1990) Inhibiting reliance on biological Weaponry: IN: Wright, S. (1990). *Preventing a Biological Arms Race*. Cambridge, Mass: MIT Press. Pg 249