

PREVENTING THE RE-EMERGENCE OF CHEMICAL WEAPONS

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The evolution of chemical weapon use since 1990

by

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INTRODUCTION

Since the Third Review Conference (8–19 April 2013), the Organisation for the Prohibition of Chemical Weapons (OPCW), the body overseeing the implementation of the Chemical Weapons Convention (CWC), has had to confront growing evidence of chemical warfare in the Syrian civil war. Syria became a party to the CWC in October 2013, but investigators have repeatedly confirmed chemical weapon (CW) use by government forces and some chemical attacks by non-state actors. In March 2018, an assassination attempt with an uncommon nerve agent in the United Kingdom, for which the British government accuses Russia, poses a completely different challenge to the CWC's future. These issues in combination with deteriorating international security cooperation have fractured consensus among states parties.

On 21–30 November 2018, the OPCW met for its Fourth Review Conference. Normally held every five years, review conferences assess the general health of the agreement, examine the status of execution of obligations on both the international and national levels, and lay out future policy directions and priorities. This

Summary

- › The Chemical Weapons Convention (CWC) is the most successful weapon control treaty ever with 193 states adhering to it.
- › However, recent incidents of chemical weapon (CW) use in the Syrian civil war and as tools of assassination or terrorism challenge the CWC.
- › Negotiated with large-scale international chemical warfare and huge military stocks of CW in mind, the small volumes of agent that now make up CW use and preparations pose a challenge to the CWC.
- › Geopolitical interests mean that the procedures for investigating allegations of CW have become controversial, even though all parties to the CWC have approved them.
- › Notwithstanding, the threat posed by CW has shrunk considerably since the Cold War as a consequence of internationally supervised weapon elimination.

time, a two-day regular session of the annual Conference of States Parties preceded the Review Conference (19–20 November) to adopt the work programme and budget for 2019. The Fourth Review Conference failed because deep divisions over how to address the various allegations of CW use precluded consensus decision-making.

This Brief looks at the ways the international community has responded to the new developments to preserve and strengthen the norm against CW use. It first offers a short historical overview of chemical warfare, followed by a review of resurgent use of toxic agents. It next introduces the CWC. A discussion of the challenges the new-found utility of such agents pose to the convention concludes the Brief.

A SHORT HISTORY OF CHEMICAL WARFARE

Modern chemical warfare began during the First World War. In an attempt to restore mobility to a stalemated Western Front, Imperial German forces released around 160 metric tonnes (mt) of chlorine against allied lines near the Belgian town of Ypres on 22 April 1915. It was the moment when science, industry and military art converged with the purpose of designing and further developing a novel weapon. Over the next three years, all major belligerents researched a widening variety of toxic compounds and deployed them in increasing volumes to the battlefronts.

No war after the Armistice in 1918 would see similar quantities of agent consumed again. While CW was still used in colonial and international armed conflicts (new doctrines involving air power were being considered and a new category of nerve agents was discovered while researching insecticides in the late 1930s), Europe was spared the horrors of generalised chemical warfare in the Second World War – even though the Nazi extermination camps murdered humans on an industrial scale with hydrogen cyanide as part of the Holocaust and Japan launched multiple CW attacks against Chinese cities and positions.

After 1945, the threat of chemical warfare was overshadowed by the spectre of the nuclear bomb. Nevertheless, the US and the USSR continued to develop agents and delivery systems, as well as CW defences, in the process building up combined stockpiles possibly in excess of 150–200,000 mt of agent in the final decade of the Cold War.

Use of CW in support of military campaigns became relatively rare. Almost all major incidents occurred in the Middle East, starting with Egypt's chemical bombardments in the Yemen civil war during the 1960s.

The Iran–Iraq War witnessed CW deployed on a scale not seen since the First World War. It was also the first conflict during which saw nerve agents used on the battlefield and CW-supported combat operations employed with genocidal intent against a country's own population. In the 1960s and 1970s, US forces utilised lachrymatory and anti-plant agents during the almost fifteen-year intervention in Indochina. Most recently, the Syrian civil war since 2011 saw the first confirmed CW attacks since the entry into force of the CWC in 1997.

NEW USES OF CW

Since the CWC's opening for signature in 1993, there have been several incidents exploiting the toxic properties of chemicals to harm humans. They include acts of terrorism, as well as targeted assassination and executions. Toxic chemicals also reappeared in warfare with both state and non-state actors resorting to them. While some incidents retained certain characteristics of past warfare scenarios, the substances also began to serve different purposes. Finally, actors have not relied on traditional warfare agents in all incidents; rather they have turned to commercially or industrially available toxicants in support of their goals. Several incidents also combine the characteristics of the different new uses of CW.

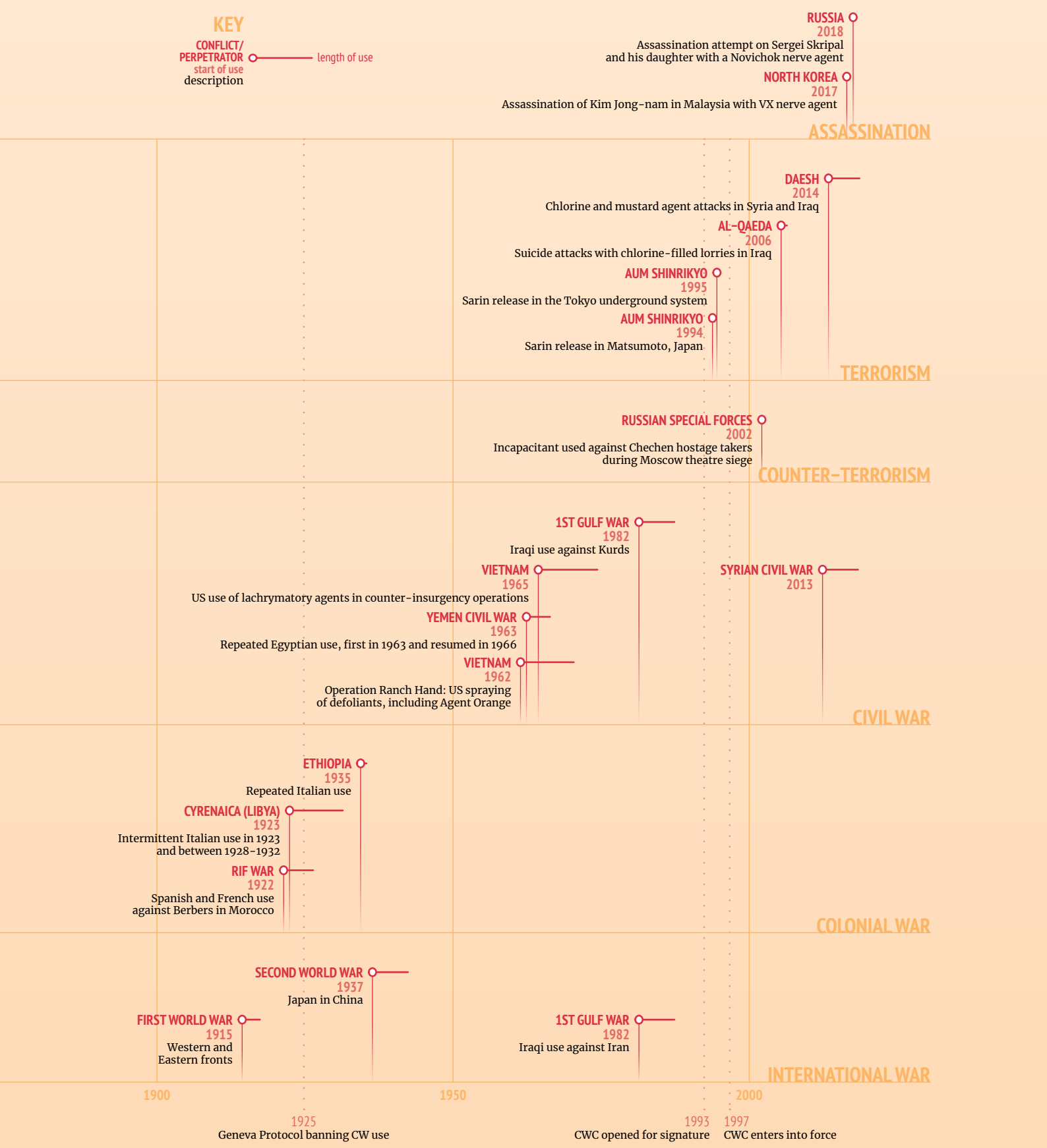
Terrorism with chemical weapons

While terrorists are known to have had a long-standing interest in poisonous substances, incidents have remained far and few between.¹ Most cases concern interest in and discovery of literature on manufacturing poison agents, and attempts at synthesis or extraction.

The Japanese cult Aum Shinrikyo synthesised sarin and used it in two indiscriminate attacks. The first one in the town of Matsumoto in June 1994 was directed against judges who were on the verge of ruling against the cult in a land dispute. Eight citizens died, while several hundred suffered exposure to the nerve agent. The second one took place in the Tokyo underground in March 1995. A diversionary attack designed to prevent the police from raiding Aum Shinrikyo's premises killed 13 people, injured over one thousand, and left several thousand people suffering from psychological problems and post-traumatic stress disorder. Fortunately, the cult's original goal of manufacturing 80 mt of sarin in an effort to destabilise the Japanese government never materialised.

There have been no other terrorist attacks on a similar scale since then. The complexities of weapon development and production, the threat of discovery by law enforcement agencies, as well as the meagre marginal benefit these weapons might offer in pursuit of

FIGURE 1: CHEMICAL WEAPONS USE



an entity's goals possibly explain the absence of major incidents.²

Opportunistic use of industrial toxicants

Between October 2006 and July 2007, al-Qaeda in Iraq (AQI), the precursor organisation to Daesh, conducted a series of suicide attacks by detonating lorries filled with liquid chlorine against mostly Iraqi targets. They were the first sign of large-scale opportunistic use of an industrial toxicant in combat. Prior to this campaign, only a single similar incident had been reported: in 1990, Tamil Tigers used chlorine from containers at a nearby paper mill to sustain an attack on a fort held by the Sri Lankan armed forces when they ran low on conventional munition.³

Opportunistic use is characterised by the absence of any weapon development or production by the perpetrator and the cessation of such attacks after the supply's depletion.⁴ AQI had intercepted the lorries carrying chlorine for water purification from Jordan and Syria to Baghdad; following the Iraqi government's order to halt the transports, the attacks stopped, too. Few people suffered chlorine exposure, as the detonation of explosives rigged to the lorries also destroyed most of the agent.

CW use by terrorist entities as a method of warfare

From late 2014 on, Daesh would reprise the AQI types of chemical attack on a smaller scale during the Syrian civil war. The group showed signs of trying to develop improvised delivery systems for chlorine (in the form of mortar rounds) and made some attempts at synthesising and using mustard agent. Both in Syria and Iraq, Daesh sought to integrate the use of CW in combat operations with the primary aim of terrorising opposing forces.⁵ From a military viewpoint, those attacks had limited impact and produced few casualties. Yet, they created an unprecedented legal situation. In operations against Kurdish insurgents in north Syria, Daesh as a non-state actor used CW against another non-state actor on the territory of a state party to the CWC, which was not in control of that territory. Having acceded to the CWC by the time of the events, the Syrian government was not able to act against those violations in accordance with its treaty obligations.

Military use of CW in the Syrian civil war (December 2012 – present)

CW use mostly by government forces and to a lesser extent by insurgent factions and Daesh were confirmed by the UN Secretary-General's investigators prior to Syria's accession to the CWC in October 2013 and since then by the OPCW's Fact-Finding Mission. The OPCW

declared the destruction of all Syria's Category 1 chemicals at the end of August 2014.⁶ After that milestone, a common industrial chemical, chlorine, delivered by rockets and barrel bombs dropped from helicopters became an agent of choice almost 100 years after its first use. There were also a few confirmed small-scale attacks with sarin, which the UN-OPCW Joint Investigative Mechanism in at least in once instance, at Khan Shaykhun on 4 April 2017, linked to Syria's method of sarin production.⁷

Use of military-type of agents as assassination weapons

The final development concerns the use of military-type warfare agents to assassinate individuals by non-state actors or state agents. In January 1995, two months before the attacks in the Tokyo underground, Aum Shinrikyo sprayed the VX nerve agent on four critics and dissidents. One person died; the other ones survived. The cult has also been reported to have executed around 20 dissident members with VX in its premises.⁸

In February 2017, Kim Jong-nam, half-brother of North Korean leader Kim Jong-un, was murdered with a binary form of VX at Kuala Lumpur International Airport in Malaysia. Just over a year later, in March 2018, an assassination attempt was made against the former Russian intelligence agent Sergei Skripal. In this case, an uncommon nerve agent belonging to the family of Soviet-developed Novichoks (newcomers) was deployed in Salisbury, UK. Skripal's daughter Yulia, a responding police officer, and two citizens who a few months later came in contact with the container used to transport the nerve agent were also exposed. (One British citizen eventually succumbed).

Despite some similarities, including the fact that both incidents happened on the territory of CWC states parties, the incidents in Kuala Lumpur and Salisbury are also different: North Korea, which is commonly presumed to be behind the murder of Kim Jong-nam, is not a party to the CWC while Russia, to whom all evidence points in the attempt against the Skripals, is.

PROHIBITING CW

The CWC is to date *the* most complete weapon control treaty negotiated and in force. One document prohibits CW acquisition, possession and use; sets up the OPCW as an intergovernmental organisation to oversee treaty implementation; orders the destruction of existing stockpiles and CW-related equipment and infrastructure under international supervision; organises verification activities to ensure and certify CW destruction, monitor chemical industry activities in an effort to preclude illicit development and production, as well as the trade in chemicals of concern to the conven-

tion; develops resources, procedures and capacities to aid parties in case they face a threat with CW or have become the victim of their use; and mandates programmes to ensure that all states – developing countries in particular – may benefit from the peaceful uses of chemistry, including relevant scientific and technological advances.⁹

Deliberations to prohibit CW began in the 1970s but failed to make much progress. In 1984, the United States presented a blueprint for the future convention that helped to structure negotiations. Chemical warfare during the 1980–88 Iran–Iraq War added urgency to the discussions. It represented a major breach of the 1925 Geneva Protocol, the only international agreement then in force banning the use of CW. The war also demonstrated the international community's inability to investigate and respond to such a breach.

The CWC was opened for signature in January 1993 and entered into force on 29 April 1997. In its more than two decades of operation, the treaty has proved successful: the OPCW received the Nobel Peace Prize for 2013 in recognition for these unrelenting efforts to secure a CW-free world.¹⁰ One of the OPCW's core activities is overseeing the destruction of declared stockpiles of CW and related infrastructure and equipment.

Universality

As of 1 January 2019, 193 states are party to the convention, making it the international document with the largest number of adherents after the UN Charter. Only four countries still need to join: Egypt, Israel, North Korea, and South Sudan. Of these, Israel is a signatory state. Diplomatic demarches by the Technical Secretariat of the OPCW and states parties have thus far proven unsuccessful in persuading the hold-out states to ratify or accede to the CWC. That said, in November 2017, a South Sudanese diplomatic representative announced that his government was preparing accession to the treaty.

CW destruction

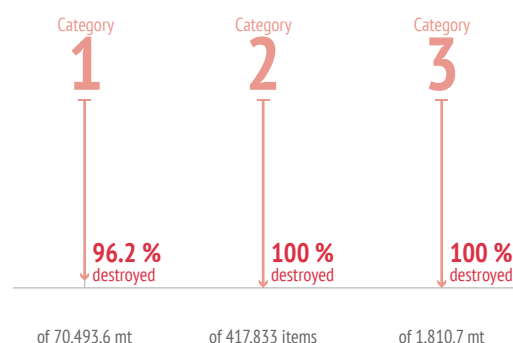
Eight states parties declared a combined 72,304.275 mt of Category 1 and 2 CW: Albania, India, Iraq, Libya, Russia, South Korea, Syria, and the United States. Category 1 CW comprises Schedule 1 agents, as well as munitions filled with Schedule 1 agents (See Figure 2);¹¹ Category 2 CW covers all other toxic chemicals intended as weapons and munitions filled with them. Unfilled means of agent delivery and other equipment specifically designed to support the deployment of CW are grouped in Category 3 CW.

Figure 2: The CWC Schedules

The three Schedules are lists of (families of) toxic chemicals and their precursors in the CWC Annex on Chemicals. They support the verification regime and lay out specific reporting, verification and inspection obligations for the Technical Secretariat and states parties. Each schedule considers whether a particular compound (or family of compounds) has a history in chemical warfare and balances the threat it poses to the objectives and purpose of the treaty with legitimate commercial interests.

- › Schedule 1 contains chemicals that can be used as CW and have few uses for non-prohibited purposes. They are subject to the most stringent controls.
- › Schedule 2 includes past warfare agents and key precursors to CW, but which generally have greater commercial application.
- › Schedule 3 chemicals may serve to produce CW but are also used in large quantities for non-prohibited purposes.

Figure 3: CW destruction
(as of 31 December 2017)



Data: OPCW, 2017

Figure 3 summarises the status of destruction operations.¹² With Russia having formally completed destruction of its Category 1 CW on 27 September 2017, the 3.7% of Category 1 CW that still await elimination are located in the United States. US officials now estimate that all elimination activities will cease in September 2023, or more than 11 years past the formal extended destruction deadline (10+5 years after entry into force of the CWC, i.e. 2012). Unless new states join the convention and declare fresh CW holdings, all destruction operations are therefore projected to end in 2023.

States parties must also declare former CW production facilities and ancillary infrastructure and destroy them under OPCW supervision (unless the organisation au-

thorises conversion to peaceful purposes under strict conditions). 14 parties have declared a total of 97 production facilities.

A treaty in transition

With complete CW destruction in sight, the CWC is transitioning into a new phase. For several years now, attention has gradually been shifting to future challenges and the ways in which the OPCW can set new policy priorities to meet them. Such future challenges include the impact of science and technology on the convention, and the possibility of new types of toxic agents (including incapacitants) and delivery systems. Industrial chemical production processes have changed considerably since the treaty became operational, as has the trade in chemicals and transfer of technology across the world. The organisation's routine functions of verifying pertinent industry activities will continue, even though it is clear their definition of purpose and certain modalities and procedures will soon require major updating to retain their relevance.

The OPCW is also in the process of developing a culture of prevention, for which it collaborates with the chemical industry and the scientific community. It invests considerable resources in regional and national capacity building in areas such as chemical security and safety, emergency response, forensics, and laboratories, as well as in education and outreach to key stakeholder communities. International cooperation and technology exchanges for peaceful purposes and assistance are equally key to maintaining global interest in the CWC.

SHIFTING PERCEPTIONS OF THE CW THREAT AND THE CWC

Since the negotiation of the CWC, the nature of CW threat has changed considerably. The verified destruction of virtually all declared CW means that the world no longer faces potential war scenarios or health and environmental catastrophes involving deliberate or accidental release of many tens of thousands of agent tonnes. With Russia and the US firmly committed to CW disarmament at the end of the Cold War, attention shifted to other states whose arsenals were considerably smaller.

However horrible the 1980–88 Gulf War was, the overall volume of Iraq's CW ranged in the lower thousands of tonnes.¹³ Syria declared around 1,300 mt in 2013, most of which were precursor chemicals to warfare agents.¹⁴ Libya, which had started up its CW pro-

gramme in the 1980s, managed to produce some 24 mt of mustard agent.¹⁵

For terrorist entities, the relevant quantities drop even lower: Aum Shinrikyo had the ambition to manufacture up to 80 mt of sarin, but ultimately managed synthesis only in the kilogram range. Some of the more recent incidents involving the use of toxic chemicals, including the assassination operations in Malaysia and the UK, only required a few grammes of agent. Chlorine, corrosive products as used in acid attacks, rodent poisons or certain basic ingredients (e.g. castor beans from which the highly lethal toxin ricin is derived) are often widely available industrial or commercial commodities.

Application of the CW definition

In many respects, the CWC has for its declaration thresholds and inspections industrial volumes of chemical production and consumption in mind. Notwithstanding, the OPCW remains concerned by small volumes of widely available toxicants because the treaty does not frame the interdiction on CW use in terms of their nature or structure, their degree of lethality, or quantities involved. Given that many toxic chemicals and their precursors once used or considered as CW have legitimate applications, the convention does not ban the products *per se*, but rather considers their purpose. The principle is known as the General Purpose Criterion (GPC) and is contained in the definition of a CW in Article II, 1(a):

Toxic chemicals and their precursors, *except where intended for purposes not prohibited under this Convention*, as long as the types and quantities are consistent with such purposes. [Emphasis added]

Paragraph 2 furthermore clarifies the meaning of 'toxic chemical':

Any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals. This includes all such chemicals, regardless of their origin or of their method of production, and regardless of whether they are produced in facilities, in munitions or elsewhere.

Both paragraphs combined imply that by default *all* toxic chemicals – past, present, and yet to be discovered – are prohibited. Article II, 9 identifies only four categories of non-prohibited purposes:

- (a) Industrial, agricultural, research, medical, pharmaceutical or other peaceful purposes;
- (b) Protective purposes, namely those purposes directly related to protection against toxic chemicals and to protection against chemical weapons;

- (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.

Consequently, *only* if used in function of one of those non-prohibited purposes will the convention not consider a toxic chemical as a CW. At this point, the definition of CW cited above does impose qualitative and quantitative limitations, but these are not fixed and are relative to the nature of the non-prohibited purpose. Thus, for example, no chemical listed in any of three Schedules may be retained or acquired as a riot control agent and under Article III, 1(e) a state party must declare the chemical structure and international registry number of any riot control agents in its possession. A state party may also synthesise a nerve agent – a Schedule 1 chemical – for testing gas masks, for instance, but volumes are strictly limited and the activity must take place at a single, specially designated facility.

The GPC's function also becomes clearer when considering chlorine. Despite being the agent of the first major attack near Ypres in April 1915, by the end of the First World War few people still considered it effective. Since then, its commercial importance has only grown: global annual production of chlorine exceeded 59 million mt in 2012.¹⁶ Production, trade and consumption volumes, as well as the dispersal of the chlorine industry across the world make reporting and verification impractical under the CWC. Despite being unscheduled, the OPCW has investigated and confirmed chlorine strikes in Syria.

Many commentators less familiar with the CWC tend to view the prohibition's application to be limited to the Schedules. Some states parties, notably Russia nowadays (it did not during the CWC negotiations), maintain a similar narrow interpretation.

Prevention of chemical warfare

To prohibit chemical warfare, the CWC combines a comprehensive prohibition with deterrence. Given the default position that all toxic chemicals are prohibited, the CWC applies at all times. Under Article I, states parties undertake *never under any circumstances* to use CW. They cannot develop, produce, otherwise acquire, stockpile or retain CW, nor can they engage in any military preparations to use CW (e.g. open-air release of warfare agents, training of soldiers in offensive strategies and tactics, etc.). The article also outlaws methods of warfare involving riot control agents, such as lachrymatory agent (the so-called 'tear gases'), commonly available to police forces around the world.

A state party may also not transfer, directly or indirectly, CW to anyone, or assist, encourage or induce,

in any way, anyone to engage in any activity prohibited to a state party under the CWC. This can include financing of CW acquisition by another entity or assisting another entity with the cover up of CW use (e.g. by obstructing investigation of alleged use). The phrasing covers non-state actors, too, irrespective of whether they are natural persons (i.e. nationals of a state party or foreigners operating on its territory) or legal persons (domestic and foreign companies). The convention imposes the enactment of domestic legislation, not just to ensure implementation of the verification-related activities mentioned earlier, but also to criminalise and penalise any form of CW acquisition and use by criminal or terrorist entities.¹⁷

The deterrence component comprises two elements, namely assistance and protection against CW, on the one hand, and the challenge inspection in response to alleged illicit activities or investigation of alleged chemical attacks combined with state party action in response to the findings, on the other hand.

Protection has always been viewed as a significant means to neutralise any military advantage an attacker might hope to gain from using toxic chemicals. As a chemical agent affects its target through environmental mediation, interposing a barrier will significantly diminish the weapon's utility, and hence its potential attraction.¹⁸ The CWC negotiators thus reinforced the relevancy of protection.¹⁹ It includes, *inter alia*, detection equipment and alarm systems; protective gear; decontamination equipment and decontaminants; medical antidotes and treatments; and advice on any of these protective measures. Assistance involves the coordination and delivery of protection. States parties undertake to contribute materially or financially to the OPCW's assistance capacity, while over the past two decades the organisation has developed and implemented national and regional programmes to enhance protective capacities.

The second deterrence dimension consists of the challenge inspection or investigation of alleged CW use. Any state party may call for a challenge inspection in another state party if it believes that a treaty violation is taking place at a declared or undeclared location. The challenge inspections, carried out by OPCW inspectors, take place at short notice. The challenged party has no right of refusal, even though during the pre-inspection onsite negotiations it may call for a procedure of managed access to the site. In that case, the challenged party must provide enough evidence that no illicit activities take place in the site areas or locations in a building off limits to inspectors.²⁰ An investigation resembles a challenge inspection in many respects. However, its purpose has two distinct aspects: (1) establishing the violation of one of the CWC's core prohibitions, i.e. use, and (2) determining the needs of a party having suffered a CW attack or facing a CW threat.²¹ Despite the differences in specificity and consequences of both

types of investigations, the modalities for their request and conduct in the field are identical.²²

CONSEQUENCES FOR THE CWC

The CWC's application is not limited to warfare only. Because the GPC defines any toxic chemical as a CW unless intended for a non-prohibited purpose, any incident to harm humans or animals represents a case of CW use. This means that the pertinent provisions relating to assistance, investigations of alleged use, and determination of violation and restoration of compliance with the CWC retain their relevancy.

However, new uses of CW raise different types of questions. When is the use of a toxic chemical a domestic crime; when an international incident? What is the role of the OPCW in such incidents; under which circumstances might states prefer not to draw in the organisation? How does one condemn a perpetrator; how does one restore compliance? Do states parties share a consensual view on the role of the OPCW when such incidents occur? If not, what is the relevance of the organisation? May the political responses to incidents challenge the utility and integrity of the OPCW's procedures?

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