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Raining Hellfire: An Analysis on the Use of White Phosphorus and its International Regulation

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Chemical weapons, biological weapons, nuclear weapons, and substance-infused munitions are not new in the art of war. In fact, accounts of toxins and venoms date back to ancient times when bows and arrows were cutting-edge technology. But the existing frameworks regulating these weapons require immediate and more exacting scrutiny. In late 2023, Hamas reignited a generations-old conflict with Israel through a surprise attack. Shortly thereafter, global headlines reported Israel was deploying white phosphorus—a highly volatile substance—into Gaza. The potential devastation of white phosphorus is shocking, yet the existing legal frameworks governing its use are both ambiguous and overly lenient. This Comment argues both for a comprehensive reevaluation of the global governance of chemical and biological weapons and calls for the establishment of a white phosphorus convention. In doing so, it will explore how the current legal frameworks have been shaped by the history of these weapons, analyze the ambiguities surrounding white phosphorus use, and recommend actions to mitigate its deployment and the uncertainty in its regulation.

I. Introduction & Background

On October 7, 2023, the militant and political group—Hamas—launched a surprise attack against Israel as rockets rained down from the skies.[1] Hamas was originally established by Sheikh Ahmed Yassin in 1987 with a primary mission of dismantling Israel and instituting "an Islamic society in historic Palestine."[2] Currently, Hamas is the *de facto* ruling party of Palestine,[3] but is only one of the two existing political parties, the other being Fatah, which prefers a less militant approach towards resolving the ongoing Israel-Palestine dispute.[4]

Mere days after Hamas' initial bold attack on Israel, Human Rights Watch (HRW) verified Israeli deployment of the highly dangerous white phosphorus in Gaza.[5] Analyzing video and photographic evidence of munitions exploding above Gaza, HRW was able to conclude the munitions were armed with white phosphorus because of the white powder-like trails falling to the ground.[6] HRW collected additional evidence via interviewing witnesses, reporting a "stifling" smell.[7] According to HRW, both "white smoke and a garlic smell" are characteristics closely

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[1] Daniel Byman & Mackenzie Holtz, *Why Hamas Attacked When It Did*, CTR. FOR STRATEGIC AND INT'L STUD. (Dec. 6, 2023), https://www.csis.org/analysis/why-hamas-attacked-when-it-did [https://perma.cc/S4YC-6UNK].

[2] Kali Robinson, *What Is Hamas?*, COUNCIL ON FOREIGN RELS., https://www.cfr.org/backgrounder/what-hamas [https://perma.cc/28VA-WXLB] (Last updated Oct. 31, 2023 11:40 am).

[3] Zena Al Tahhan, *Hamas and Fatah: How are the two groups different?*, AL JAZEERA (Oct. 12, 2017), https://www.aljazeera.com/features/2017/10/12/hamas-and-fatah-how-are-the-two-groups-different [https://perma.cc/2FL4-N653].

[4] *Id.*

[5] *Israel: White Phosphorus Used in Gaza, Lebanon*, HUMAN RTS. WATCH (Oct. 12, 2023), https://www.hrw.org/news/2023/10/12/israel-white-phosphorus-used-gaza-lebanon [https://perma.cc/G4YA-7C2V].

[6] *Id.*

[7] *Id.*

associated with white phosphorus deployment.[8]

The purpose of this Comment is to explain what white phosphorus is, why it is so detrimental, how it evades global regulation, and what solutions should be implemented to ensure safety from its harms. To achieve this goal, this Comment uses six operative sections. The first section analyzes what white phosphorus is, how it works, and its dangers. The second section lays out the history of chemical weapon use and development, setting the stage for understanding the development of the legal infrastructure. The third section analyzes the advent of the governing international regime from its origins and looks at related regulatory efforts. The fourth section discusses the two treaties comprising the current regime, dissecting them, and providing adequate insight into their effect. The fifth section points out inadequacies with the current regime as it relates to white phosphorus regulation. The final operative section proposes possible solutions to aid in fixing the current regime's problems, and hopefully, shed light on why changes are necessary.

II. What is White Phosphorus?

White phosphorous is a chemical notorious for causing calamitous harm to almost any organism or inanimate object it encounters,[9] but goes unnoticed by international law. White phosphorus is an exceptionally flammable and sticky chemical, which "ignited spontaneously in air at temperatures above 30°C" and continues burning until it completely depletes itself up or is "deprived of oxygen."[10] Although white phosphorus ignites at relatively low air temperature, it burns at a staggering 815°C, equal to 1,500°F, resulting in extreme illumination.[11] Because of white phosphorus' innate capability to create vast amounts of smoke and light, militaries across the globe employ it both for battlefield illumination and smokescreens.[12] But, white phosphorus is notably more famous for its incendiary effects, causing severe and irreparable damage when used in artillery weapons.[13]

White phosphorus can cause devastating human harm through numerous avenues, but primarily either chemically or thermally.[14] Because white phosphorus in munitions is a powder, human eyes and skin are at severe risk of exposure.[15] For instance, eye contact with white phosphorus can lead to severe cornea damage and serious conditions like perforation.[16] White phosphorus ingestion and inhalation can also lead to "[w]hole-body" symptoms, including fluid accumulation in the lungs, nausea, severe pain, illuminated bodily fluids, and potential rapid onset death "due to complete cardiovascular collapse."[17]

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[8] *Id.*
[9] Callan, *infra* note 162 at 193.
[10] *White Phosphorus*, WORLD HEALTH ORG. (Oct. 20, 2023), https://www.who.int/news-room/fact-sheets/detail/white-phosphorus [https://perma.cc/ZS3B-R5UJ] [hereinafter WHO].
[11] HUMAN RTS. WATCH, *supra* note 5.
[12] *Id.*
[13] *Id.*
[14] *Id.*
[15] *See id.*
[16] *White Phosphorus*, CTR. FOR DISEASE CONTROL AND PREVENTION, https://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750025.html#:~:text=White%20phosphorus%20causes%20severely%20painful,the%20formation%20of%20phosphoric%20acid [https://perma.cc/26XG-P4GF] (Last visited Jan. 15, 2023) [hereinafter CDC].
[17] *Id.*

Additionally, external contact with white phosphorus can cause life-altering skin damage.[18] White phosphorus is fat-soluble, meaning it will burn when coming in contact with skin, and continuing to burn until it reaches bone.[19] Treating these kinds of wounds is tricky because even after the initial trauma subsides, white phosphorus wounds can be reignited when dressings are removed and the chemical is re-exposed to oxygen.[20] Therefore, white phosphorus is not only incredibly precarious when handling, but "[e]ven relatively minor burns are often fatal"[21] because "there is no antidote for white phosphorus toxicity."[22]

III. Chemical Weapon Background

A. Pre-World War I & The Great War: The Emergence of Chemical Weapons

While widespread chemical weapons became popularized and are associated with World War I, there is evidence of chemicals used in warfare dating back to the ancient Greeks.[23] For example, Homer's *Odyssey* explicitly mentions dipping bronze arrows in "mankilling drugs."[24] Likewise, ancient philosophers opined on the treatment of wounds caused by poisoned weapons, and how to do so effectively.[25] Yet modern use of chemicals in warfare did not begin to actually emerge until the 19th century when British naval officer, Thomas Cochrane, suggested using sulfur dioxide gas against Napoleon's troops.[26]

Cochrane planned to load sulfur and coal into British ships and sail near French-held land, waiting until French troops were downwind of the ships, setting the sulfur on fire, resulting in a French exodus, allowing British forces to invade.[27] Unfortunately for Cochrane's forward-thinking military strategy, his suggestion was rejected in 1812, 1846, and again in 1854 during the Crimean War.[28] It was not until World War I that chemical weapons would re-emerge, introducing their devastation to the world.[29]

On April 22, 1915, the German military released 160 tons of weaponized chlorine gas, which slowly crept across no-man's-land, and into the trenches of the unsuspecting French troops.[30] Upon infiltrating French trenches, sparking mass pandemonium, the chlorine "killed more than 1000 French and Algerian soldiers, while wounding approximately 4000 more.[31] But because the Germans lacked significant faith in the efficacy of their newfound weapon, they had no plans of

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[18] *See* WHO, *supra* note 10.
[19] *Id.*; *see also* Human Rts. Watch, *supra* note 5.
[20] Human Rts. Watch, *supra* note 5.
[21] *Id.*
[22] CDC, *supra* note 16.
[23] *See generally* Werner Schreiber, *Plant Poisons in Medieval Warfare*, 41 Med. Bull. 48, 48-52 (1984).
[24] *Id.*
[25] *Id.* at 48-49.
[26] Wyndham D. Miles, *The Idea of Chemical Warfare in Modern Times*, 31 J. Hist. of Ideas 297, 298 (1970).
[27] *Id.*
[28] *Id.*
[29] *See id.*
[30] Gerald J. Fitzgerald, *Chemical Warfare and Medical Response During World War I*, 98 Am. J. Pub. Health 611, 611 (2008).
[31] *Id.*

actually capitalizing on their success by advancing across the battlefield, which eventually allowed the French to recover.[32] Although Ypres was uneventful for the Germans, their discovery of the might of chlorine gas saw the entrance of a new kind of weapon into the theater of war, thus changing the trajectory of warfare.[33]

Germany's chemical production efforts were spearheaded by Fritz Haver—the "founder of chemical weapons."[34] German High Command enthusiastically endorsed Haber's advances, and Germany's academic and industrial prowess allowed them to produce chemical weapons on a scale unseen by history.[35] Haber's success with chlorine gas at Ypres ushered in new discoveries of other terrifying chemical agents like phosgene, mustard gas, and lewisite.[36]

But despite chemical weaponry's effectiveness in the combat arena, chemical weapons were responsible for "killing proportionately few soldiers in World War I," [37] accounting for approximately 90,000 deaths and leaving nearly one million soldiers with "debilitating injuries."[38] One of the more iconic features of chemical weapons in World War I was for purposes of psychological manipulation, causing what was known as "gas fright."[39] But the horror and power of chemical weapons left a lasting impression on the world, allowing World War I to be dubbed the "Chemist's War."[40]

B. Post-World War I: The Disappearance of Chemical Weapons?

Chemical weapons took the world by storm during World War I, but World War II saw the "virtual absence of chemical warfare" although both the Allied and Axis powers had the capability to manufacture and use chemical weapons.[41] After discovering the raw power of chemical weapons in World War I, this absence is quite puzzling, especially in the face of a vicious Nazi regime blazing through Europe.[42] Two likely explanations for the lack of chemical weapons on World War II's battlefield are the significant fear of a swift and violent retaliation by opposing forces, and because of the institution of the 1925 Geneva Protocol, "reflecting a broader informal consensus that chemical warfare was a separate and heinous form of conflict."[43]

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[32] *Id.* at 612.
[33] *See id.*
[34] *Id.* at 613.
[35] *See id.*
[36] *Id.* at 612-14.
[37] *Id.* at 612.
[38] *Looking back helps us look forward*, Org. for the Prohibition of Chem. Weapons, https://www.opcw.org/about-us/history#:~:text=During%20the%20first%20half%20of,renewed%20interest%20in%20the%20field [https://perma.cc/3CNQ-VQC3] (Last visited Dec. 19, 2023) [hereinafter OPCW].
[39] Fitzgerald, *supra* note 30 at 612.
[40] *How World War I Also Became Known as The Chemist's War*, Nat'l Archives, https://text-message.blogs.archives.gov/2011/06/20/how-world-war-i-also-became-known-as-the-chemists-war/ [https://perma.cc/CM8H-7K56] (June 20, 2011).
[41] Jeffrey W. Legro, *Why Were Chemical Weapons Not Used in World War II?*, in History in Dispute: World War II, 1943-1945, 101, 102 (Dennis Showalter ed., 2000).
[42] *Id.* at 102 (discussing the refusal by the Soviets, Americans, and British to introduce chemical weapons against the Axis forces during World War II).
[43] *Id.* at 102-03.

The fear of chemical weapons was accompanied by a sense of unease because of chemical weapons' volatility and unpredictability, thus adding to their danger because "like most other weapons its usefulness depended on how and when it was deployed."[44] But despite the "anomol[y]" of chemical weapons' disappearance, chemicals were still used in different manners by both the German and Japanese forces "against defenseless victims" in internment camps[45] and countries were still stockpiling chemical agents from World War I and investing in the development of new chemical agents.[46] For example, in 1928 the U.S. military's chemical weapons branch, the Chemical Warfare Service (CWS) pinpointed "mustard agent (HS), methyldifluorarsine (MD), diphenylaminechlorarsine (DM), chloroacetophenone (CN), titanium tetrachloride (FM), white phosphorus (WP), and hexachlorethane (HC)" as the seven top priority chemical agents for battlefield research and development.[47]

The frontier of chemical weapons shifted again in the 1930s when Dr. Gerhard Schrader, known as "the father of nerve agents,"[48] discovered tabun and sarin gas.[49] Both tabun and sarin gas are nerve agents, widely considered "the most toxic and rapidly acting of the known chemical warfare agents" and can easily be dispersed in either vapor or liquid form, making them extremely versatile and effective.[50] With the genesis of nerve agents, States began conducting research on biological weapons like anthrax, but on a far lesser scale since their unpredictability could lead to adverse impacts on allied forces.[51] Despite the anxiety that chemical and nerve agents may enter World War II's theater, the weapons were not used, and the threat was only discovered after the end of the war.[52] But the fears were confirmed since it was unearthed that "Germany produced approximately 78,000 tons of chemical warfare agents. This included about 12,000 tons of the nerve agent tabun, produced between 1942 and 1945."[53]

C. The Cold War Era

"The Cold War period saw significant development, manufacture and stockpiling of chemical weapons."[54] Global trepidation of chemical weapons did not simply dissipate with the fall of the

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[44] *Id.* at 102.
[45] *Id.* at 101.
[46] *See id.* at 102.
[47] Jeffrey K. Smart, *History of Chemical and Biological Warfare: An American Perspective*, *in* Medical Aspects of Chemical and Biological Warfare, 9-86 (Frederick R. Sidell M.D., Ernest T. Takafuji M.D., David R. Franz D.V.M. eds., 1997).
[48] *Gerhard Schrader: Father of the Nerve Agents*, Collaborative for Health & Env't, https://www.healthandenvironment.org/environmental-health/social-context/history/gerhard-schrader-father-of-the-nerve-agents#:~:text=Gerhard%20Schrader%20(February%2025%2C%201903,father%20of%20the%20nerve%20agents.%22 [https://perma.cc/KG4L-K8TL] (Last visited Dec. 26, 2023).
[49] Smart, *supra* note 47 at 30.
[50] *Facts About Tabun*, Ctr. for Disease Control and Prevention, https://emergency.cdc.gov/agent/tabun/basics/facts.asp [https://perma.cc/9NE8-PXYK] (Last visited Dec. 26, 2023); *see also Sarin*, Ctr. for Disease Control and Prevention, https://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750001.html [https://perma.cc/DZ5G-VLMT] (Last visited Dec. 26, 2023) (describing the nature of sarin, warning that exposure "can cause death in minutes").
[51] Smart, *supra* note 47 at 31-32.
[52] *Id.* at 36.
[53] *Id.*
[54] *Chemical Weapons*, United Nations Off. of Disarmament Affs.,

Third Reich but flowed into the Cold War with the U.S. government conducting espionage to uncover the extent of the Soviet Union's (USSR) chemical weapon progress.[55] U.S. intelligence expressed serious fear that USSR, Afghanistan, and other Asian countries would increase their use of chemical weapons because they "may calculate that the abhorrence of chemical warfare is slowly being eroded as the development and use of chemical weapons by an increased number of countries becomes an accepted norm."[56] This fear of imminent chemical weapon deployment was only exasperated by intelligence reports claiming the USSR's chemical weapon stockpile ranged from a bewildering "70,000 metric tons" to "300,000 metric tons."[57] More unsettling is the fact that the USSR's stockpile was comprised primarily of the world's most dangerous chemical agents, including weaponized forms of sarin, mustard gas, lewisite, and VX[58]—one of the most lethal nerve agents in existence.[59] But, the USSR's actual stockpile was much less than intelligence reports, totaling around "40,000 tons of chemical agents."[60]

The U.S. also had a chemical weapons stockpile, totaling "more than 30,000 tons of chemical warfare agents," rivalling that of the USSR.[61] Like the USSR's surrogates during the Vietnam War, the U.S. tactically dispersed chemical agents, primarily herbicides, into thick jungle foliage.[62] The driving purpose for the use of herbicides in Vietnam was "to defoliate areas to reduce cover for enemy forces, improve visibility on the perimeters of military installations, and for a short time to kill enemy crops."[63] But "the most widely used herbicide was Agent Orange."[64] The U.S. military "sprayed 11 million gallons of Agent Orange over 20 million acres" during the Vietnam war.[65] Eventually, use of Agent Orange was banned by the U.S. after discovering its link to lethal conditions such as Parkinson's disease, lung cancer, prostate cancer, and leukemia—yet the list is more extensive.[66] Sadly, Agent Orange exposure caused "[o]ver 300,000 U.S. veterans and over 400,000 Vietnamese" deaths *only during the Vietnam War period* from the 1960s to 1970s.[67]

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https://disarmament.unoda.org/wmd/chemical/ [https://perma.cc/2DBN-HPX5] (Last visited Dec. 26, 2023) [hereinafter UNODA].

[55] *The Soviet Offensive Chemical Warfare Threat to NATO*, CENT. INTEL. AGENCY, https://www.cia.gov/readingroom/docs/DOC_0000284028.pdf [https://perma.cc/NAL6-DDB2], at 7, 13 (Last visited Dec. 26, 2023).

[56] *Id.* at 13.

[57] *Id.* at 7.

[58] Milton E. Blackwood, Jr., *Arsenic and Old Weapons: Chemical Weapons Disposal in Russia*, 6 NONPROLIFERATION REV. 89, 90 (1999) (*see* Table 1: *Declared Russian Chemical Munitions Storage Sites*).

[59] *See VX*, CTR. FOR DISEASE CONTROL AND PREVENTION, https://www.cdc.gov/chemicalemergencies/factsheets/vx.html [https://perma.cc/35RZ-A8TR] (Last visited Dec. 26, 2023); *see generally* Peter R. Chai, et al., *Toxic chemical weapons of assassination and warfare: nerve agents VX and sarin*, 1 TOXICOLOGY COMMC'N 21, 21 (2017).

[60] Blackwood, Jr., *supra* note 58 at 89.

[61] Press Release, U.S. Department of Defense, *US Completes Chemical Weapons Stockpile Destruction Operations* (July 7, 2023), https://www.defense.gov/News/Releases/Release/Article/3451920/us-completes-chemical-weapons-stockpile-destruction-operations/ [https://perma.cc/2XXH-2T4G].

[62] Committee On Blue Water Navy Vietnam Veterans and Agent Orange Exposure, BLUE WATER NAVY VIETNAM VETERANS AND AGENT ORANGE EXPOSURE at 47 (2011).

[63] *Id.*

[64] *Id.*

[65] *Agent Orange Effects*, CLEV. CLINIC, https://my.clevelandclinic.org/health/symptoms/24689-agent-orange-effects [https://perma.cc/Y7XJ-UU98] (Last visited Dec. 26, 2023).

[66] *Id.* (listing the number of conditions caused by Agent Orange exposure).

[67] *Id.*

IV. Legal Infrastructure Development

A. Regulatory Efforts Before the Chemist's War

The earliest semblance of international recognition of the dangers of chemical weapons was in 1675, which took the form of the first bilateral agreement between France and Germany to ban chemical weapons.[68] This compact, called the Strasbourg Agreement of 1675, prohibited using "poison bullets" in warfare was set in motion after one of Leonardo da Vinci's designs using "powdered arsenic and powdered sulphur" was surprisingly created and used.[69] Despite beginning the discussion of chemical weapon regulation, the world would not see any more efforts until two centuries later.

The next step towards global recognition of chemical warfare's dangers was the Project of an International declaration concerning the Laws and Customs of War, or the 1874 Brussels Declaration, initiated by Czar Alexander II of Russia.[70] Article 13 of the 1874 Brussels Declaration explicitly forbid the "[e]mployment of poison or poisoned weapons," thereby extending the Strasbourg Agreement of 1675's limited ban on "poison bullets" to all weapons.[71] Unfortunately, Czar Alexander's proposition was not ratified, however, it was the impetus leading to The Laws of War on Land of 1880 (the Manual), proposed by the Institute of International Law to operate as a manual for military conduct during wartime.[72] The Manual was intentionally designed to allow independent States the ability to integrate it as part of their legal system to "restrain the destructive force of war, while recognizing its inexorable necessities."[73] Like Article XIII of the 1874 Brussels Declaration, Article VIII of the Manual broadly forbid the "use of poison, in any form."[74] Shortly thereafter, regulatory efforts were addressed by the world in The Hague, Netherlands.

The Hague Convention, ratified in 1899 (Hague Convention) took monumental steps towards chemical weapon regulation similar to the modern regime.[75] The contracting States to the Hague Convention agreed to ban and "abstain from the use of projectiles the sole object of which is the diffusion of asphyxiating or deleterious gases."[76] Despite the international community's awakening of the dangers weaponized chemicals could present, the Hague Convention's prohibition lacked teeth, allowing for subjective State interpretations "regarding the types of

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[68] Kim Coleman, A History of Chemical Warfare at 7 (2005).

[69] *Id.*

[70] *Project of an International Declaration concerning the Laws and Customs of War. Brussels, 27 August 1874.*, Int'l Comm. of the Red Cross, https://ihl-databases.icrc.org/en/ihl-treaties/brussels-decl-1874#:~:text=On%20the%20initiative%20of%20Czar,the%20draft%20with%20minor%20alterations [https://perma.cc/2JD2-DBBQ] (Last visited Dec. 27, 2023).

[71] Project of an International Declaration Concerning the Laws and Customs of War, art. XIII, Aug. 27, 1874 [hereinafter 1874 Brussels Declaration].

[72] *See* The Laws of War on Land, Inst. Of Int'l Law, Preface (1880), http://hrlibrary.umn.edu/instree/1880a.htm#:~:text=The%20laws%20of%20war%20do,%2C%20unjust%2C%20or%20tyrannical%20acts [https://perma.cc/7MTA-569J].

[73] *Id.*

[74] *Id.* at art. VIII.

[75] *See generally* Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land, (Oct. 18, 1907) [hereinafter Hague Convention IV].

[76] *Id.* at Declaration.

weapons" covered.[77] But as States seemed primed to adapt and face the impending norm of facing chemical warfare during armed conflict, governments responded to global outcry of chemical weapons' destructive nature by outright condemning their use. For example, Article 5 of the Washington Naval Treaty of 1922 recognized

> The use in war of asphyxiating, poisonous or other gases, and all analogous liquids, materials, or devices, having been justly condemned by the general opinion of the civilized world and a prohibition of such use having been declared in treaties to which a majority of the civilized Powers are parties.[78]

Only three short years later, the regime would encounter another marked shift, but the focus would be directly on tackling chemical weapons.

In the wake of World War I's atrocities, the League of Nations passed the Protocol for the Prohibition of the Use in war of Asphyxiating, Poisonous or Other gases, and of Bacteriological Methods of Warfare, or the 1925 Geneva Protocol (1925 Geneva Protocol or the Protocol).[79] The Protocol's language almost identically tracks that of the Washington Naval Treaty, showing how foundational previous efforts like the Washington Naval Treaty set the stage for the 1925 Geneva Protocol.[80] The Protocol prohibits "the use in war of asphyxiating, poisonous or other gases, and of all analogous liquids materials or devices," and states that use of chemical weapons "has been justly condemned by the general opinion of the civilized world."[81] Additionally, the State Parties to the 1925 Geneva Protocol presaged the later development of biological weapons and extended the prohibition of chemical weapon use to the "use of bacteriological methods of warfare."[82]

Unfortunately, the 1925 Geneva Protocol had a disastrous symptom like the Washington Naval Treaty in that it lacked teeth, and importantly, specificity. The crucial characteristic of the 1925 Geneva Protocol is that it did not ban chemical weapon research and development—only *use*.[83] Like the Hague Convention's subjective interpretive nature, the 1925 Geneva Protocol likewise allows for selective interpretation, giving more industrialized State Parties the opportunity to amass vast chemical weapon stockpiles.[84] Because of the 1925 Geneva Protocol's lackluster language, many States held reservations about the Protocol, leading to a "no-first-use agreement" view towards the Protocol, which States adopted as military policy.[85]

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[77] Catherine Joyce, *Dulce et Decorum: The Unique Perception of Chemical Warfare and the Enforcement of the Geneva Protocol in the 21st Century*, 28 Pac. McGeorge Global Bus. & Dev. L.J. 331, 336-37 (2015).
[78] Treaty relating to the Use of Submarines and Noxious Gases in Warfare, Washington, Feb. 6, 1922, 25 L.N.T.S. 202 [hereinafter Washington Naval Treaty].
[79] Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other gases, and of Bacteriological Methods of Warfare, June 17, 1925, 94 L.N.T.S. 65 [hereinafter 1925 Geneva Protocol or the Protocol].
[80] *See id.*
[81] *Id.*
[82] *Id.*
[83] *See generally id.* (lacking any prohibition on chemical weapon development, confining the international community's condemnation and prohibition simply to use).
[84] *See id.*; *see* Washington Naval Treaty, *supra* note 78; *see also* OPCW *supra* note 38.
[85] *History of the Biological Weapons Convention*, UNITED NATIONS OFF. OF DISARMAMENT AFFS., https://disarmament.unoda.org/biological-weapons/about/history/ [https://perma.cc/R8VA-G4AC] (Last visited Dec. 27, 2023).

In other words, the 1925 Geneva Protocol was less successful at bringing about a utopia devoid of chemical weapons, but effectively created the philosophy that if one State was attacked using chemical weapons, it could open the flood gates for chemical weapon retaliation.[86] But chemical and biological weapon discussions took a backseat following World War II because the international communities gaze shifted towards nuclear weapons; so chemical weapons were tabled until after the 1968 Treaty on the Non-Proliferation of Nuclear Weapons resolution.[87]

B. The Biological Weapons Convention (BWC): Chemical Weapons Convention on the Horizon

Soon thereafter, in the early 1970s, the Biological Weapons Convention (BWC) was negotiated and opened for signature. [88] The BWC's aim, was "eliminating from the arsenals of States, through effective measures, such dangerous weapons of mass destruction as those using *chemical* or bacteriological (biological) agents."[89] While the focus of the BWC is the "complete disarmament" of biological weapons that States may possess, it conspicuously gives credit to the 1925 Geneva Protocol for laying the foundation and conspicuously acknowledges chemical weapons within its locus.[90] With nuclear and biological non-proliferation agreements already in place, a chemical weapons agreement finally seemed to be next in the queue.

But "[n]egotiations on the Chemical Weapons Convention took much longer."[91] The occurrence of numerous global events pushed the needle towards chemical weapon regulations. In the 1980s, the U.S. assisted Iraq during the Iran-Iraq War, yet despite Iraq's constant barrage of chemical weapons "almost on a daily basis" against Iran, the U.S. "did not intervene in anyway," and was actually "assisting the Iraqis with battlefield intelligence.[92] In turn, the United Nations responded by condemning Iraq's actions, but did nothing else, allowing the U.S. to turn a blind eye to Iraq's chemical weapon deployment, thereby showcasing the sheer weakness of past chemical weapon regulatory efforts, and the need for something more substantial.[93] Therefore, the world set its sights on altering the landscape of chemical weapons via the Chemical Weapons Convention.[94]

V. The Current Regime: The CWC and CCW

A. The Chemical Weapons Convention

The Chemical Weapons Convention (CWC) "is a momentous advance" in international efforts to combat chemical weapons development and eliminate them from arsenals altogether.[95] Like the

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[86] *Id.*
[87] *Id.* (discussing how resolving the Nuclear Non-Proliferation Treaty assisted in pushing the chemical and biological weapons conventions forward).
[88] *Id.*
[89] Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxic Weapons and on Their Destruction, Apr. 10, 1972, 1015 U.N.T.S. 163 [hereinafter BWC].
[90] *Id.*
[91] OPCW, *supra* note 38.
[92] Joyce, *supra* note 77 at 345.
[93] *See id.*
[94] Barry Kellman, *The Advent of International Chemical Regulation: The Chemical Weapons Convention Implementation Act*, 25 J. Legis., 117, 117 (1999).
[95] *Id.* at 118.

BWC, the CWC harkens back to its roots and traces its regulatory framework to its ancestor—the 1925 Geneva Convention—recognizing the setting boundaries for chemical weapons as an absolute necessity to preserve society.[96] In acknowledging the BWC as a sibling regulation, the CWC actively seeks "to exclude completely the possibility of the use of chemical weapons," from warfare, holding steadfast "that the achievements in the field of chemistry should be used *exclusively* for the benefit of mankind," not its destruction.[97]

Article I of the CWC is one of the operative provisions of the CWC, outlining the obligations of any State electing to become a Party and subject itself to the CWC's control.[98] Article I's prohibitions are broad, strictly requiring all State Party's "never"

> (a) To develop, produce, or otherwise acquire, stockpile or retain chemical weapons, or transfer, directly or indirectly, chemical weapons to anyone;
> (b) To use chemical weapons;
> (c) To engage in any military preparations to use chemical weapons;
> (d) To assist, encourage or induce, in any way, anyone to engage in any activity prohibited to a State Party under this Convention.[99]

Clearly, the CWC repairs some glaring holes in the 1925 Geneva Protocol's language excluding a production ban, confining the ban only to *use*, making clear to right this wrong by banning all chemical weapon production, use, and more.[100] But the definition is doomed to the same fate as the 1925 Geneva Protocol by its breadth, allowing for varying interpretations applicable to a multitude of different substances.[101] One potential rationale for supplying such a loose definition could be to adapt to new "international situations as they [arise], rather than requiring a new treaty every time one nation thought up a new chemical weapon, or a different use for an old one."[102] The CWC also takes liberties with its authority, charging every State Party with the obligations to both "destroy chemical weapons it owns or possesses," and "destroy any chemical weapons production facilities it owns or possesses."[103]

Article II further seeks to resolve historical confusion regarding what constitutes a chemical weapon by supplying the much-needed definitions of both "chemical weapon" and "toxic chemicals."[104] According to Article II's definition, a "chemical weapon" constitutes

> (a) Toxic chemicals and their precursors, except where intended for purposes not prohibited under this Convention, as long as the types and quantities are

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[96] Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, Sep. 3, 1992, S. Treaty Doc. No. 103-21, 1974 U.N.T.S. 45 at Preamble [hereinafter CWC].
[97] *Id.*
[98] *See generally id.* at art. I.
[99] *Id.*
[100] *Compare id.* (differentiating between development and acquisition activity of chemical weapons in subparagraph (a) of Article I, and "use" of chemical weapons in subdparagraph (b)), *with* the 1925 Geneva Protocol, *supra* note 79 (only mentioning global condemnation of chemical weapon "use").
[101] Joyce, *supra* note 77 at 346.
[102] *Id.* at 351.
[103] CWC, *supra* note 96 at art. I.
[104] *Id.* at art. II.

consistent with such purposes;
(b) Munitions and devices, specifically designed to cause death or other harm through toxic properties of those toxic chemical specified in subparagraph (a), which would be released as a result of the employment of such munitions and devices;
(c) Any equipment specifically designed for use directly in connection with the employment of munitions and devices specified in subparagraph (b).[105]

Likewise, because Article II necessitates chemical weapons contain "toxic chemicals" as a base, the definition is also supplied for "toxic chemicals":

> 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.[106]

Interestingly though, unlike Article II's "chemical weapons" definition, the "toxic chemicals" definition suffers a unique ailment—by being too broad, yet too narrow.

Article II's scope is broad, specifically going to the distance to encompass "all such chemicals."[107] But Article II also impairs itself from its inception by handcuffing the definition of "toxic chemicals" not to realistically include "all such chemicals," but rather, only chemicals that act "on life processes."[108] In fact, pursuant to Article II's requirements, while a chemical may be widely considered toxic "and have the potential to cause a great deal of harm,"[109] it could be curiously excluded from the CWC's protections if its chemical nature does not primarily act "on life processes."[110]

The CWC marks a new age in the chemical weapons regime not only because it outlines what the global community collectively considers "chemical weapons," but because it enacts limited enforcement mechanisms.[111] Article III lays out the structural foundation for some of the mechanisms designed to ensure State Party compliance with the CWC's requirements.[112] Article III has four operative subparagraphs, the first be subparagraph (a),[113] pertaining to chemical weapons within a State Party's possession; subparagraph (b),[114] pertaining to old or "abandoned chemical weapons;" and subparagraph (c), pertaining to chemical weapons facilities.[115]

Although Subparagraph (a) contains five subdivisions, only four subdivisions are pertinent with

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[105] *Id.* at art. II (definition of "chemical weapons")
[106] *Id.* at art. II (definition of "toxic chemicals")
[107] *Id.*
[108] *Id.*
[109] *See id.*; *see also* Joyce, *supra* note 77 at 349-50 (discussing *Bond v. United States*, 572 U.S. 844, 844 (2014)).
[110] *See* CWC, *supra* note 96 at art. II(2) (definition of "toxic chemicals" requiring them to act "on life processes").
[111] *See* Kellman, *supra* note 94 at 118.
[112] *See generally* CWC, *supra* note 96 at art. III.
[113] CWC, *supra* note 96 at art. III(1)(a) (relating to existing chemical weapons).
[114] *Id.* at art. III(1)(b) (relating to old or abandoned chemical weapons).
[115] *Id.* III(1)(c) (relating to chemical weapons production facilities).

respect to the CWC's treatment of existing chemical weapons.[116] Subparagraph (a) stipulates that all State Parties must "declare" whether or not it owns any chemical weapons,[117] "specify the precise location" and approximate quantity and type of chemical weapons in the State Party's possession,[118] and "report" any chemical weapons that may be in the State Party's jurisdiction that may belong to another State.[119] But the most substantive of the four key subdivisions is the fifth, requiring State Parties to destroy *all* chemical weapons within its territory.[120] The destruction requirement is indiscriminate, requiring State Parties to destroy not only their own chemical weapons, but those of other States that may have chemical weapons within its borders.[121]

Subparagraph (b) is simple, within merely three subdivisions requiring State Parties to "declare" whether they have old chemical weapons within their territory,[122] abandoned chemical weapons within their territory,[123] or abandoned chemical weapons in another States' territory.[124] But, subparagraph (c) attacks chemical weapons at the source, outlining seven requirements for State Parties with chemical weapon production facilities, which are remarkably similar to subparagraph (a)'s requirements.[125] Subparagraph (c) stipulates all State Parties must "declare" whether it has possessed any production facilities within its jurisdiction since World War II,[126] "specify" any production facilities it has possessed since World War II,[127] and "report" whether another State has had a production facility located within its territory since World War II.[128] But, subparagraph (c) goes further, by requiring State Parties to also "declare" whether or not it has "transferred or received, directly or indirectly, any equipment" to create chemical weapons since World War II.[129] Additionally, subparagraph (c) goes to great lengths to ensure chemical weapon production facilities are accounted for, but also no longer used for the purpose of producing chemical weapons.[130] Similar to subparagraph (a)'s destruction provision,[131] subdivision (c) also incorporates a stipulation that State Parties must "plan for destruction of any chemical weapons production facilities it owns or possess."[132] Again, like the indiscriminatory nature of subparagraph (a)'s destruction requirement, subparagraph (c)'s destruction provision follows suit, charging State Parties to plan the destruction of "*any*" chemical weapons production facilities.[133]

Notably, subparagraph (c)'s provisions discussing production facilities allow for alternatives to

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[116] *See generally id.* at art. III(1)(a).
[117] *Id.* at art. III(1)(a)(i) (the declaration requirement).
[118] *Id.* at art. III(1)(a)(ii) (the specification requirement).
[119] CWC, *supra* note 96 at art. III(1)(a)(iii) (the reporting requirement).
[120] *Id.* at art. III(1)(a)(v) (the destruction requirement).
[121] *See id.* at art. III(1)(a)(v).
[122] *Id.* at art. III(1)(b)(i).
[123] *Id.* at art. III(1)(b)(ii).
[124] *Id.* at art. III(1)(b)(iii).
[125] CWC, *supra* note 96 at art. III(1)(c); *compare* CWC, *supra* note 96 at art. III(1)(a), *with* CWC, *supra* note 96 at art. III(1)(c).
[126] CWC, *supra* note 96 at art. III(1)(c)(i) (the declaration requirement for production facilities).
[127] *Id.* at art. III(1)(c)(ii) (the specification requirement for production facilities).
[128] *Id.* at art. III(1)(c)(iii) (the reporting requirement for production facilities).
[129] *Id.* at art. III(1)(c)(iv) (the equipment transfer declaration requirement).
[130] *Id.* at art. III(1)(c)(v)-(vii).
[131] *Id.* at art. III(1)(a)(v) (the destruction requirement).
[132] *See* CWC, *supra* note 96 at art. III(1)(c)(v) (the production facilities destruction provision).
[133] *Id.*

destruction.[134] Subparagraph (c) allows for State Parties to simply close existing chemical weapons facilities under their jurisdiction,[135] or "plan for any temporary conversion" of production facilities into *destruction* facilities.[136] While the temporary conversion provision may seem counter-intuitive to the aims of the previous provisions, it exists to carry out subparagraph (a)'s aim for the destruction of chemical weapons.[137] Such a stringent regime change begs the question: how will the CWC's aims be enforced against State Parties?

The first part of the CWC's solution to this question falls under Article VIII, which conceptualizes the Organization for the Prohibition of Chemical Weapons (OPCW) and its internal organizational structure.[138] From the outset, Article VIII outlines the OPCW's purpose to "achieve the object and purpose this Convention, to ensure the implementation of its provisions, including those for *international verification of compliance* with it, and to provide a forum for consultation and cooperation among State Parties."[139] Moreover, Article VIII automatically binds all CWC State Parties OPCW as "members," and does not allow a State Party from being precluded as an OPCW member.[140]

The OPCW consists of three branches, or "organs": The conference of the State Parties (the Conference)[141], the Executive Council,[142] and the Technical Secretariat.[143] The Conference is the "principal organ of the OPCW"[144] and comprised of "all members of" the OPCW, allowing a single representative from each member.[145] As the "principal organ" of the OPCW, the Conference oversees "the powers and functions of the Executive Council and the Technical Secretariat."[146] Pursuant to this oversight function, the Conference has the power to "issue guidelines in accordance with [the] Convention to either" of the coordinate branches "in the exercise of their functions."[147]

The Executive Council falls underneath the Conference, and is comprised of "41 members," all of whom are elected by the conference according to "equitable geographical distribution."[148] Moreover, the elected members are not permanent. While they do serve time-limited terms, the Conference has the power to reconsider the Executive Council's composition based "developments," which remains ambiguous.[149] As the Conference serves as the primary legislative

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[134] *Id.* at art. III(1)(c)(vi)-(vii).
[135] *Id.* at art. III(1)(c)(vi) (the production facility closure provision).
[136] *Id.* at art. III(1)(c)(vii) (the production facility temporary conversion provision).
[137] *See id.* at art. III(1)(c)(vii); *see also* CWC, *supra* note 96 at art. III(1)(a)(v).
[138] CWC, *supra* note 96 at art. VIII ("The Organization").
[139] *Id.* at art. VIII(A)(1).
[140] *Id.* at art. VIII(A)(2).
[141] *Id.* at art. VIII(A)(4); *see also* CWC, *supra* note 96 at art. VIII(B) (outlining the Conference).
[142] CWC, *supra* note 96 at art. VIII(A)(4); *see also* CWC, *supra* note 96 at art. VIII(C) (outlining the Executive Council).
[143] CWC, *supra* note 96 at art. VIII(A)(4); *see also* CWC, *supra* note 96 at art. VIII(D) (outlining the Technical Secretariat).
[144] CWC, *supra* note 96 at art. VIII(B)(19).
[145] *Id.* at art. VIII(B)(9).
[146] *Id.* at art. VIII(B)(20).
[147] *Id.*
[148] *Id.* at art. VIII(B)(23)(a)-(f) (specifying the number of Executive Council positions allotted to each region).
[149] CWC, *supra* note 96 at art. VIII(B)(25).

OPCW body, the Executive Council serves as the "executive organ" of the OPCW, subordinate to the Conference, and must therefore "act in conformity" with the Conference's decisions.[150] The Executive Council's responsibilities, as the executive branch of the OPCW, are somewhat intuitive. It is generally required to oversee implementation of the Conference's decisions, and "consider any issue or matter" relating to compliance or non-compliance of members and make recommendations to the conference.[151] Interestingly, Article VIII allows the Executive Council to skip the Conference altogether and go directly to the United Nations General Assembly and the Security Council "in cases of particular gravity and urgency."[152]

By nature of Article VIII, the Technical Secretariat is the primary investigative organ, serving as subordinate to both the Conference and the Executive Council to help them "in the performance of their functions."[153] The Technical Secretariat's investigative function is through "verification," simply meaning the branch verifies that all State Parties are compliant with their obligations pursuant to Articles I and III.[154] Since the Technical Secretariat is more boots-on-the-ground, it is spearheaded by the Director-General, who supervises the Inspectorate.[155] The inspectors "carry out the on-site inspections that make the CWC so uniquely intrusive," and more effective than previous regulatory efforts, which help "verify the accuracy of declared information and compliance with CWC obligations."[156]

The CWC makes diligent efforts to ensure that chemical weapons and production facilities are under constant scrutiny. But the hangup is on the CWC's stated definitions of "toxic chemicals" requiring chemicals act through "chemical action on life processes."[157] While it could be that the definition is broad to allow tackling future chemical weapon issues,[158] it falls short of addressing chemical weapons also acting as *incendiary weapons*, or chemical weapons with incidental incendiary properties. Chemicals like white phosphorus are ruinous to humans, animals, and structures, yet do not fall under the CWC's definition of "chemical weapons"[159] because their inherent danger does not lie in their actions on "life processes," but rather their incendiary properties.[160] In fact, incendiary weapons are covered under an entirely different convention, colloquially known as the Convention on Certain Conventional Weapons (CCW).[161]

B. The Convention on Certain Conventional Weapons & Protocol III

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[150] *Id.* at art. VIII(B)(30).
[151] *Id.* at art. VIII(B)(35).
[152] *Id.* at art. VIII(B)(36).
[153] *Id.* at art. VIII(B)(37).
[154] *See id.*
[155] *Id.* at art. VIII(B)(41)-(42).
[156] Kellman, *supra* note 94 at 118, 121.
[157] *See* CWC, *supra* note 96 at art. II(2) (requiring any "toxic chemicals" for purposes of the CWC act "on life processes").
[158] Joyce, *supra* note 77 at 351.
[159] CWC, *supra* note 96 art. II(1)(a), *see also* CWC, *supra* note 96 at art. II(2).
[160] WHO, *supra* note 10 ("White Phosphorus is not a chemical weapon under the Chemical Weapons Convention (CWC), as it acts as an incendiary agent and not through its 'chemical action on life processes'").
[161] Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be deemed to be Excessively Injurious or to Have Indiscriminate Effects (with Protocols I-V), Oct. 10, 1980, 1342 U.N.T.S. 137 [hereinafter CCW].

The CCW was passed as an international effort to "ban or restrict the use of specific types of weapons that are considered to cause unnecessary or unjustifiable suffering to combatants or to affect civilians indiscriminately."[162] The CCW contains five Protocols individually addressing certain categories of conventional weapons used in war.[163] Protocol I broadly prohibits using any weapons using fragments that cannot be seen by X-ray.[164] Protocol II discusses certain kinds of "booby-trap" weapons, like mines.[165] Protocol IV prohibits using any kind of laser weapon with a function to "cause permanent blindness.[166] Protocol V covers using any kind of "explosive remnants of war," that are not covered under Protocol II.[167] But for purposes of this discussion, the focus will be on Protocol III—covering use of incendiary weapons.[168]

Protocol III is the global community's response to at least, "in part, the use of napalm against civilians by the United States during the Vietnam War."[169] To begin, Article 1 of Protocol III defines an "incendiary weapon" as "any weapon or munition which is *primarily designed* to set fire to objects or to cause burn injury to persons through the action of flame, heat, or combustion thereof, produced by a chemical reaction of a substance delivered on the target."[170] Protocol III provides examples such as "flame throwers, fougasses, shells, rockets, grenades, mines, bombs and other containers of incendiary substances."[171] But oddly, Protocol III exempts "munitions which may have *incidental* incendiary effects, such as illuminants, tracers, smoke or signaling systems."[172]

Article 2 of Protocol III is equally important as Article I's definitions because it outlines the circumstances in which using incendiaries may violate the CCW, and therefore, international law.[173] All of Article 2's provisions prohibited instances of using incendiary weapons require them to be used with an "object of attack."[174] For reference, the first provision prohibits "in all circumstances to make the civilian population as such, individual civilians or civilian objects *the object of attack* by incendiary weapons."[175] Further, the second provision prohibits "in all circumstances to make any military objective located within a concentration of civilians *the object of attack* by air-delivered incendiary weapons."[176] Therefore, Protocol III's prohibitions do not

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[162] *The Convention on Certain Conventional Weapons*, UNITED NATIONS OFF. OF DISARMAMENT AFFS., https://disarmament.unoda.org/the-convention-on-certain-conventional-weapons/#:~:text=It%20was%20adopted%20on%2010,or%20to%20affect%20civilians%20indiscriminately [https://perma.cc/S2CT-VWHD], (Last visited Jan. 15, 2024); Michael Callan and Christopher Henry, *Baptized by Fire: Protocol III's Imperfect Ban on Incendiary Weapons Against Civilians in Times of War*, 24 B.U. PUB. INT. L. J. 175, 175-76 (2015).
[163] *See generally* CCW, *supra* note 161.
[164] *Id.* at Protocol I (Protocol on Non-Detectable Fragments).
[165] *Id.* at Protocol II (Protocol on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended on 3 May 1996).
[166] *Id.* at Protocol IV (Protocol on Blinding Laser Weapons).
[167] *Id.* at Protocol V (Protocol on Explosive Remnants of War).
[168] *Id.* at Protocol III (Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons).
[169] Callan, *supra* note 162 at 177.
[170] CCW, *supra* note 161 at Protocol III, art. 1(1).
[171] *Id.* at art. 1(1)(a).
[172] *Id.* at art. 1(1)(b)(i).
[173] *See generally id.* at art. 2 (outlining civilian protections).
[174] *See generally id.* at art. 2(1)-(4).
[175] *Id.* at art. 2(1).
[176] *Id.* at art. 2(2).

turn, necessarily on the *type* of weapon used, but the *manner* in which the weapon is deployed that dictates.[177] Thus, although Article 2 seems sufficient on its face in protecting civilian interests, it allows certain types of incendiary attacks—like those using white phosphorus—to fall outside of Protocol III's protections.[178]

Indeed, even individual States supplement Protocol III's definition of "incendiary weapon" with their own understandings of what is and is not intended to be regulated.[179] For example, the U.S. Department of Defense's (DoD) definition precisely tracks the language of Protocol III.[180] But the DoD goes further, stating that "only 'pure' incendiaries, such as napalm" are the types of weapons that Protocol III sets out to regulate.[181] The DoD even goes on to state that "white phosphorus is a munition that contains fragments of white phosphorus. It is intended primarily for marking or illuminating a target or masking friendly force movement by creating smoke."[182] Despite this identification of *some* white phosphorus' uses, it blatantly ignores the rest of the equation.[183] Unfortunately, because the CWC and CCW exempt white phosphorus use, States would still be allowed to exempt themselves from white phosphorus regulations if they were to exist.

C. Reservations, Understandings, and Declarations: A Way Out

Article 2 of the Vienna Convention on the Law of Treaties defines "reservation" as "a unilateral statement, however, phrased or named, made by a State, when signing, ratifying, accepting, approving or acceding to a treaty, whereby it purports to exclude or to modify the legal effect of certain provisions of the treaty *in their application to that State*."[184] In other words, a "reservation" is a tool for a State to change the rules of the treaty, "exempting itself from certain obligations with which state parties are normally expected to comply."[185] Scholars argue, on the one hand, that reservations, understandings, and declarations (RUDs) may be "a legitimate, perhaps even desirable, means of accounting for cultural, religious, or political value diversity across nations."[186] Mainly because RUDs are "set up by those countries that take human rights seriously," while States who do not use RUDs "have no intention of complying anyway."[187]

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[177] *See* CCW, *supra* note 161 at Protocol III, art. 2; *see also* Callan, *supra* note 162 at 186 ("Protocol III contains very strict standards governing the *use* of incendiary weapons").
[178] *See* Callan, *supra* note 162 at 186; *see also Q & A on Incendiary Weapons and CCW Protocol III*, Harv. L. Sch. Int'l Hum. Rts. Clinic, (2011) https://www.hrw.org/sites/default/files/related_material/2011_arms_qandaincendiaryweaponsccwpiii.pdf [https://perma.cc/PW6B-LFCG] ("While the article prohibits attacks on populated areas with air-delivered incendiary weapons, it permits the same kinds of attacks with ground-launched models under certain circumstances").
[179] Department of Defense Law of War Manual, Off. of Gen. Couns., Dep't of Def., (2015) https://media.defense.gov/2023/Jul/31/2003271432/-1/-1/0/DOD-LAW-OF-WAR-MANUAL-JUNE-2015-UPDATED-JULY%202023.PDF#page=444 [https://perma.cc/W8KG-QUZF].
[180] *Id.* at § 6.14.1 (defining "incendiary weapon").
[181] *Id.*
[182] *Id.* at § 6.14.1.2.
[183] *See id.* (listing some uses of white phosphorus, but not listing the use to directly attack enemies).
[184] Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331, at art. 2(1)(d) (defining "reservation") [hereinafter VLTC].
[185] Eric Neumayer, *Qualification Ratification: Explaining Reservations to International Human Rights Treaties*, 36 J. Legal Stud. 397, 397 (2007).
[186] *Id.* at 398.
[187] *Id.*

The counter-perspective is that RUDs are just a way to get out of "(almost) any obligation" they so choose.[188] The whole concept of RUDs, is that the States who would be the staunchest supporters "of the international human rights regime will set up few RUDs."[189] Therefore, because the policy behind supporting international human rights efforts is nearly "universally applicable," when key international players use RUDs to exempt themselves from treaty obligations, it "is regarded as devaluing and undermining the entire" purpose of setting international expectations through treaties.[190]

Coincidentally, both the U.S. and Israel supplied RUDs with respect to the CCW.[191] The U.S.'s *reservations* states that the U.S.:

> [R]eserves the right to use incendiary weapons against military objectives located in concentrations of civilians where it is judged that such use would cause fewer casualties and/or less collateral damage than alternative weapons, but in doing so will take all feasible precautions with a view to limiting the incendiary effects to the military objective and avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects. [192]

Moreover, the U.S. included an *understanding*, finding:

> It is the understanding of the United States of America that any decision by any military commander, military personnel, or any other person responsible for planning, authorizing, or executing military action shall only be judged on the basis of that person's assessment of the information reasonably available to the person at the time the person planned, authorized, or executed the action under review, and shall not be judged on the basis of information that comes to light after the action under review was taken. [193]

The U.S.'s reservations with respect to Protocol III were met with great hostility. In fact, seventeen other State Parties to the CCW objected to the U.S.'s reservations essentially exempting itself from Protocol III's control, only limiting itself to taking subjective "feasible precautions" to limit destruction.[194] Much like the U.S.'s *understanding* with respect to military personnel, Israel set forth a nearly identical *understanding*, by essentially allowing an affirmative defense for would-be violations of international law.[195] Therefore RUDs, like those expressed by the U.S. and Israel taint the efficacy of international efforts like the CWC and CCW.

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[188] *Id.*
[189] *Id.*
[190] *Id.*
[191] *See* CCW, *supra* note 161 at Declarations and Reservations.
[192] *Id.* at U.S.'s Reservation.
[193] *Id.* at U.S.'s Understandings.
[194] *Id.* at Objections (the governments of Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, and the United Kingdom were all the countries that issued objections).
[195] *Id.* at Israel's Understandings.

VI. Issues with the Current Regime

The international human rights infrastructure is under constant scrutiny for failing to weed out, and vindicate violations because of severely inadequate forms of international enforcement mechanisms.[196] The nature of existing enforcement mechanisms pushing international law inherently makes legal enforcement a "fundamental challenge," and often ineffective at accomplishing their goals."[197] Especially relating to efforts like the CWC and CCW, the *essential* foundations of global chemical weapons policy "have never been, on their own, terribly strong or effective," and less so in relation to incendiary weapons, and multi-purpose weapons like white phosphorus.[198]

A. Inadequate Definitions and Self-Determination

The CWC and CCW are, in a sense, related primarily because they can both trace their heritage to the 1925 Geneva Protocol. Moreover, they both set out to address issues on certain kinds of weapons the global community deems as requiring some form of oversight. Lastly, despite their intended aim, they both come up short in achieving their goals.

The CWC's provided definition of "toxic chemical" is the source of the CWC's conundrum.[199] It creates its own shackles by setting the boundary for what makes a chemical "toxic," in that it must act "on life processes."[200] Because the "chemical weapons" definition relies on what the CWC considers a "toxic chemical," any weapon containing a chemical that does not act "on life processes," but is nonetheless a toxic chemical, is automatically and permanently excluded from the CWC.[201] Thus, white phosphorus is unregulated by the CWC since its chemical properties allegedly do not "act on life processes."[202]

Similarly, Protocol III of the CCW confines its sphere of influence regarding incendiaries. Protocol III even lists the notable thermal characteristics associated with white phosphorus.[203] But, Protocol III effectively excludes white phosphorus because it "may have incidental incendiary effects," thus wholly taking for granted white phosphorus' *extensive* dangers.[204] If the insufficient definitions were not enough, it is clear that Protocol III governs how and when incendiaries are

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[196] Julia Genuess and Triestino Mariniello, *Twenty Years of the Rome Statute: Functions, Goals, Effectiveness – Challenges of the International Criminal Court*, 19 Int'l Crim. L. Rev. 905, 905-06 (2019).
[197] Anu Bradford and Omri Ben Shahar, *Efficient Enforcement in International Law*, 12 Chi. J. Int'l L. 357, 357 (2012).
[198] *Id.*
[199] CWC, *supra* note 96 at art. II(2) (defining "toxic chemicals).
[200] *Id.*
[201] *See id.*; *see also* CWC, *supra* note 96 at art. II(1) (defining "chemical weapons").
[202] WHO, *supra* note 10 (White phosphorus is not a chemical weapon under the Chemical Weapons Convention (CWC), as it acts as an incendiary agent and not through its "chemical action on life processes" (Article II.2 of the CWC)).
[203] CCW, *supra* note 161 at Protocol III, art. 1(1) (listing the characteristics establishing a weapon as an "incendiary"); see WHO, supra note 10; CDC, *supra* note 16; Harv. L. Sch. Int'l Hum. Rts. Clinic, *supra* note 178.
[204] CCW, *supra* note 161 at Protocol III, art. 1(b)(i).

used, which is dissimilar from CWC's protections banning any kind of chemical weapon use.[205] Therefore, even if white phosphorus *was* regulated by Protocol III, like other incendiaries, there are still permissible legal justifications affording an escape from being found in violation.[206]

Maybe most disturbingly are the Vienna Convention's further wounds to an already weak global legal infrastructure in two main ways.[207] Firstly, the Vienna Convention expressly grants States the discretion to *choose* when, and to what international legislation they will be bound to.[208] Moreover, if the States so choose to be bound to a piece of legislation, they can unilaterally *choose* what portions of the legislation they are going to apply to themselves by using RUDs.[209] Secondly, the Vienna Convention permits signatory States to withdraw themselves from treaties the States have signed on to, if the treaty expressly allows them to.[210] The criticisms expressed regarding RUDs, are equally applicable to the notion of self-determination in allowing States to choose what legislation will apply to them, and further, allowing States to withdraw from legislation they previously supported.[211]

The combination of State discretion and voluntary withdrawal gives States every opportunity to escape already flimsy international legal enforcement mechanisms. The very notions directly undermine the entire purpose of global human rights efforts.[212] Issues like these are entirely relevant to chemical and incendiary weapons regulations because the CWC and the CCW permit states to withdraw, or "denounce," their adherence to the legislation.[213] The following question then is: how can the inadequacies be improved?

VII. Proposed Solutions

A. Scope Expansion & Limiting State Self-Determination

The first, and perhaps most logical step, to amending the current regime is by looking directly at the CWC and CCW's definitions of toxic chemical and chemical weapons[214] and incendiary weapons.[215] The CWC requires three elements for a weapon to be a "chemical weapon": (1) it "causes harm or death through the toxic properties of toxic chemicals," (2) is "*specifically*

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[205] *See id.* at Protocol III, art. 2(1)-(4); *but see* CWC, *supra* note 96 at art. I(1)(a)-(d) (broadly prohibiting, use, development, stockpiling, or transferring chemical weapons).
[206] CCW, *supra* note 161 at Protocol III, art. 2(1)-(4); Harv. L. Sch. Int'l. Hum. Rts. Clinic, *supra* note 177 ("While the article prohibits attacks on populated areas with air-delivered incendiary weapons, it permits the same kinds of attacks with ground-launched models under certain circumstances").
[207] *See* VLTC, *supra* note 184 at art. 21.
[208] *See* VLTC, *supra* note 184 at art. 11-17 (describing the numerous ways a State may "consent" to a treaty, and the legal effect of such consent).
[209] VLTC, *supra* note 184 at art. 21 (outlining the legal effect of Reservations and Objections).
[210] VLTC, *supra* note 184 at art. 54 (generally outlining the procedure for termination or a party's withdrawal from a treaty).
[211] *See* Neumayer, *supra* note 185 at 398 ("The widespread use of RUDs, particularly by focal counties like the United States, or the use of wide-ranging RUDs, which exempt state parties from (almost) any obligation, is regarded as devaluing and undermining the entire project of codifying human rights norms in international treaties").
[212] *Id.*
[213] CWC, *supra* note 96 at art. XVI; CCW, *supra* note 160 at art. 9(1) ("Any High Contracting Party may denounce this Convention or any of its annexed Protocols by so notifying the Depositary").
[214] CWC, *supra* note 96 at art. II(1)-(2).
[215] CCW, *supra* note 161 at Protocol III, art. 1(1).

designed" to cause death or harm through its toxic properties, and (3) is *used* for purposes "dependent on the use of its toxic properties as a method of warfare."[216] Accordingly, white phosphorus clearly satisfies the CWC's first prong because white phosphorus exposure is often devastating and can result in " liver and kidney damage or failure, shock, coma, and death."[217]

Likewise, under the CCW, although white phosphorus is widely viewed as an incendiary weapon, it "does not come under the auspice" of the CCW because it does not satisfy the requirements to be considered an "incendiary weapon" because of its merely "incidental incendiary properties."[218] Therefore, because both the CWC and CCW narrowly miss the mark with regard to regulating white phosphorus, at least one but ideally both, definitions should be expanded to bring white phosphorus under the broader international weapons regulatory framework.[219] Moreover, because there is currently no incentive to adhere to Protocol III's regulated uses, increasing the scope of the existing mechanisms "to include secondary effects," thus striking away the exemption for "incidental" effects, would further incentivize compliance.[220]

State self-determination in the form of RUDs and treaty withdrawal presents a unique problem when considering that some States will naturally disagree with the opinions of others. Moreover, part of the expectation behind entering international treaties is that such treaties will be upheld by domestic courts, which will constrain the State to uphold its obligations.[221] While this may be the expectation, "domestic courts are hesitant to rule against" States that do implement RUDs.[222] Therefore, implementing RUDs under an international treaty not only exempts States from certain obligations, but "may not create any additional constraints" on the States.[223] Thus, the international community must restrict States' use of RUDs by enacting more stringent limitations, thereby holding States to the "international norms."[224] Furthermore, States must take the initiative to address the discrepancies between RUDs and the global community's views on key issues by designing internal legal mechanisms to hold the governments to the standards outlined in international legislation.[225]

B. The Call for a White Phosphorus Convention: New Horizon

Existing scholarship addressing the use of white phosphorus is split between proponents of heightened regulation[226] and opponents to regulation.[227] Regulatory opposition takes footing in

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[216] Mark Cantora, *Israel and White Phosphorus During Operation Cast Lead: A Case Study in Adherence to Inadequate Humanitarian Laws*, 13 Gonz. J. Int'l L.. 21, 37 (2010).
[217] *Id.* at 37-38.
[218] *Id.* at 37.
[219] *See* Callan, *supra* note 162 at 188.
[220] *Id.* at 193.
[221] Daniel W. Hill, Jr., *Avoiding Obligation: Reservations to Human Rights Treaties*, 60 J. Conflict Resol. 1129, 1150 (2016).
[222] *Id.* at 1130
[223] *Id.*
[224] *See id.* ("But avoiding ratification altogether indicates an unwillingness to embrace international norms concerning human rights, which are widely shared, at least rhetorically, in the international community").
[225] *See id.*
[226] *See generally* Cantora, *supra* note 216 at 54; *see also* Callan, *supra* note 161 at 193.
[227] *See* Maj. Shane R. Reeves, *The "Incendiary" Effect of White Phosphorus in Counterinsurgency Operations*, Army Law., June 2010, 84, 84.

the context of the battlefield theater, seeing white phosphorus limitations as constraining methods ensuring executing successful military campaigns.[228] Opponents advocate for "self-imposing a restrictive employment policy" for white phosphorus use, which carries the same pitfalls as issues of State self-determination and using RUDs.[229] Yet, in espousing this view that global legal limitations are not the most apt or efficient mechanisms, opponents still recognize the paramount concern in the theater of war is "minimizing civilian casualties and damage to civilian infrastructure."[230]

On the contrary, regulatory proponents take a vastly different approach. While more expansive CWC and CCW scope may suffice to counteract the dangers of using white phosphorus, proponents have called for more exacting initiatives to oversee white phosphorus' remarkable nonregulation.[231] Most notably, existing literatures, recognizing the need for global attention on white phosphorus, call for an international "White Phosphorus Convention."[232] Because current regulations allow for "an escalation from a proper legal use" to "use of it for its unequivocally illegal purposes," and its potentially disastrous lingering effects "long after the ending of hostilities," white phosphorus must be addressed on the international stages as opposed to allowing States to adopt subjective policies.[233]

The need for an international white phosphorus convention is especially important since the concerns surrounding white phosphorus use are eerily similar, if not exactly, those concerns expressed about chemical weapons prior to the CWC's passage.[234] This is not to disregard those views regarding white phosphorus' legitimate military uses,[235] which may also be a consideration in passing legislation. But an all-out white phosphorus ban—like the CWC's chemical weapons regime—may be necessary to proactively implement safeguards for civilians who might have the misfortune of interacting with white phosphorus, and to preempt white phosphorus' monstrous and inhumane use.[236]

VIII. Conclusion

Israel's deployment of white phosphorus in a zone with such a high civilian concentration[237] is troubling, especially considering white phosphorus' perils.[238] Yet despite existing literature voicing opposition to white phosphorus, it is entirely legal under the existing international legal regime. But more importantly, the current conundrum surrounding the disparity between the legality of

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[228] *Id.* at 89-90.
[229] *Id.* at 90; *see also* Hill, *supra* note 221 at 1130; Neumayer, *supra* note 184 at 398.
[230] Reeves, *supra* note 227 at 89.
[231] Cantora, *supra* note 216 at 54; Callan, *supra* note 162 at 193.
[232] Cantora, *supra* not 216 at 54, 61.
[233] *See id.* at 60; *see also* Reeves, *supra* note 227 at 89.
[234] Cantora, *supra* note 216 at 60.
[235] Reeves, *supra* note 227 at 86.
[236] *See* Cantora, *supra* note 216 at 61; *see also* Callan, *supra* note 162 at 193.
[237] *The Gaza Strip: Tiny, cramped and as densely populated as London*, ASSOC. PRESS (Dec. 5, 2023), https://apnews.com/article/israel-gaza-hamas-war-90e02d26420b8fe3157f73c256f9ed6a#:~:text=Gaza%20has%20a%20population%20density,buildings%2C%20but%20also%20many%20parks [https://perma.cc/A9BE-CUM] ("Gaza has a population density of about 14,000 people per square mile (5,500 per square kilometer)").
[238] *See* WHO**,** *supra* note 10; *see also* CDC, *supra* note 16.

white phosphorus use, and the ethics behind it, brings to light the necessity for global awareness. While there are existing international protections in place addressing a range of weapons, there is a gaping hole where white phosphorus regulations should fit. Especially because the rationales underlying the 1925 Geneva Convention, the CWC, and the CCW's Protocol III are identical to the justification for implementing white phosphorus regulations. For while white phosphorus and subsidiary white phosphorus munitions remain standard practice in arsenals and combat, "civilians and civilian structures remain at unnecessary risk of suffering, death, and destruction."[239]

[239] Callan, *supra* note 162 at 193.