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Chapter 15

INTOXICANTS IN WARFARE

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15
INTOXICANTS IN WARFARE

Łukasz Kamieński

The conflation of "drugs" and "war" is usually associated with the "war on drugs". This, however, is not only the most recent appearance of the age-old synergy between intoxicants and warfare, but is also somewhat paradoxical, because historically force has been employed for the very opposite reason: not to suppress illicit substances but to secure drug markets. Armed conflicts were thus at times waged "for drugs", of which the mid-nineteenth-century Opium Wars are the primary example. Over the centuries, with mind-altering substances gaining in potency and with warfare becoming increasingly "drugged", the intoxicants-war relationship has expanded and become intertwined, from the medicinal use of psychoactive substances to their supervised administration for the enhancement of combat performance, the funding of war-making with tax revenues and illicit drug production and trafficking to the attempted weaponization of intoxicants, and from soldiers' unauthorized recreational drug-taking to veterans' struggles with addictions and the changing patterns of post-bellum substance manufacture, consumption, and regulation. This chapter aims to crack the code of two of these types: the use of drugs by soldiers (both self-prescribed and authorized by the military) and the employment of psychotoxic substances as chemical non-lethal weapons (NLWs). To this end, it seeks to briefly outline some aspects of the multifaceted psychopharmacological landscape of warfare across compounds, use patterns, continents, and time, with the main focus on the twentieth and twenty-first centuries.

Two recent examples prove that intoxicants continue to play a role in military affairs. First, in February 2019, Major Emre Albayrak, a US Marine Corps officer, put forward a bold proposition. He argued for the microdosing personnel with psychedelics to enhance intelligence operations, and perhaps also combat performance. Microdosing 10–20 micrograms of lysergic acid diethylamide (LSD) is sub-perceptual, i.e., insufficient to produce any hallucinogenic or harmful effects, but sufficient to provide noticeable cognitive augmentation. Albayrak's advice, given this, was that supplying soldiers with minute quantities of LSD should be considered (Albayrak 2019).

The second case is this: in March 2017, the US Patent and Trademark Office granted the Californian company Saint Brand Cannabis a patent for a "Cannabinoid formulation for the incapacitation of a human or animal" designed for "rendering a subject intoxicated, incapacitated, and/or immobilized" (*Cannabinoid* 2017, 1). The inventor touted a marijuana-based NLW as perfect for riot control and urban warfare, notwithstanding the fact that the use

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of incapacitating agents in armed conflict is outlawed under the 1993 Chemical Weapons Convention (CWC 1993, article II.2).

Stories about intoxicants in military contexts are usually perceived as sensational, but the fact is that combatants have self-medicated with a variety of drugs throughout most of history. The practice, even if officially not permitted, was usually overlooked insofar as it did not undermine combat effectiveness and troop morale. Equally unexceptional was the approved employment of drugs either to improve the performance of an army's own units or to impair the fighting capacity of the enemy. Therefore, neither military pharmacological enhancement nor the concept of psychochemical armaments are new phenomena. If examples like the two aforementioned propositions – for personnel augmentation with microdoses of LSD and a cannabinoid weapon – generate public astonishment, it is because such practices, although well-established, have not hitherto been widely known.

The taboo: intoxicants, war, and historiography

While the "war on drugs" has been studied extensively (for a recent take on the subject, see, i.e., Crandall 2020), the use of mind-altering substances in contexts of armed conflict has been generally neglected in scholarship. Until recently, intoxication was not seen as an appealing subject for the discourse on war, and the topic was given greater attention by the historians of drug use and control policies (Courtwright 2001; Davenport-Hines 2004; Rasmussen 2008), yet with little influence on military historians. Five reasons as to why the relationship between intoxication and war was for so long an untold story can be identified (Kamieński 2016a, 293, 2016b).

First, because until the mid-twentieth century the therapeutic use of drugs (such as alcohol, opium, morphine, heroin, cocaine, and amphetamine) was commonplace, it was generally not at issue. Substances that today are controlled for being harmful were formerly legal and vital medicines. As a consequence, there was also little debate about dependence among soldiers and returned veterans, who developed their addictions through treatment or self-medication. The military use of psychopharmaceuticals as such also received scant attention, often leading to a situation in which the line between therapy and enhancement was blurred.

Second, the employment of intoxicants by armed forces was, overall, kept covert. Secrecy was crucial when the goal was to improve combat efficiency and thereby gain or maintain tactical edge. Clandestineness was even more important when psychoactive compounds were used, or being attempted to be used, as a weapon, either to subvert the enemy or its civilian population (by supplying drugs to undermine their fighting power and resilience) or to incapacitate them (through militarized psychochemical agents).

Third, since the early twentieth century, secrecy has been further fostered by the ambiguity of the practice of drugging the ranks. The development of proscriptive and prohibitionist policies, beginning in the 1910s with the Hague International Opium Convention of 1912 and the US Harrison Act of 1914, made the approved use of intoxicants among militaries increasingly taboo (Kamieński 2016a, 293). A government that penalizes mind-altering substances would want to keep covert their authorized distribution to servicemen. This double standard has been obscured by a veil of secrecy, which has also encompassed the field of scholarship.

Fourth, the research on combat motivation overlooks the pharmacological factor because it is unsettling for the authorities to acknowledge that such powerful forces as patriotism or nationalism may not suffice to commit citizens to battle. British military historian John Keegan gave a concise answer to the question of "why soldiers fight": it is because of inducement,

coercion, and narcosis (Keegan 1997). The first incentive, a positive motivation, is achieved through socialization into military life, bonding, ideology, good leadership, and rewards. The second reason, a negative motivation, comprises training, discipline, obedience, and sanctions. However to inspire courage and help them endure the hardships of the battlefield, soldiers would often need a psychoactive stimulus.

Finally, many scholars have simply seen intoxicants and intoxication as irrelevant in explaining war. This view located drugs outside mainstream military history, next to such niche topics as contagious disease, climate, or sex. But as the field of military history has expanded beyond its formerly narrow boundaries, what was previously neglected is now considered a proper subject of study, be it epidemiology, environment, or sexuality. Similarly, the growing body of literature on the war-related functions of intoxicants is a harbinger of a long overdue "pharmacological turn" in war studies (Andreas 2020; Bergen-Cico 2012; Kamieński 2016a; Kan 2009; Ohler 2017; Pugh 2018).

Calling for a cultural history of alcohol in France, Thomas Brennan argued that "we can learn a great deal about society through the prism of a wine glass" (Brennan 1989, 85). Likewise, it has eventually become acknowledged that a great deal can be learned about war and the military through the prism of intoxicants. The recognition of the roles that psychopharmacology has played in armed conflicts provides an alternative and complementary perspective. It offers to shed new light on the three levels of analysis which Paul Kennedy calls "war from *below*" (the individual experience of fighting), "war from *the middle*" (how things got done and who did them at the tactical and operational levels), and "war from *above*" (the strategic and diplomatic conduct of a conflict) (Kennedy 2010, 38). The main focus of this chapter is the second one; it will also consider, to a lesser extent, the first level.

An overview of drug use by combatants

Men have fought while intoxicated on plentiful occasions for much of history. It is, therefore, imperative to identify the main motivating factors for and patterning of the use of intoxicants in military settings. Medical treatment apart, these can be grouped into five central categories discussed in this section: (1) soothing nerves and raising fighting spirits, (2) improving stamina, endurance, and performance, (3) limiting or mitigating the mental cost of combat, (4) fostering group cohesion and boosting morale, and (5) killing the monotony and banality of daily soldierly life. These are examined in detail through the historical examples of particular wars, military operations, and their effects on warfighters; more detailed contextual information is provided by the literature referred to throughout the chapter.

Inspiring courage

In *The Anatomy of Courage*, Lord Moran, Prime Minister Winston Churchill's physician, argues that every soldier has a certain supply of courage: it is "his capital and he is always spending" (2007, XXII). While no one has unlimited reserves, it is possible to recharge them. Invoking Moran's metaphor, intoxicants, like alcohol and opium (which, although they are typical depressants, both can work as mild stimulants when taken in small doses), cocaine, and amphetamines, may serve as replenishers of courage. The problem, however, is that these supplementary chemical supplies cannot be saved for later use, and the repeatability of dosing-for-recharging involves the risk of habit-formation. Thus, the double-edge: intoxicants have lifted soldiers' morale and bravery but also quite often impaired their combat capability and created the problem of addiction.

The most favorite pharmacological motivator is alcohol, the provider of the proverbial "Dutch courage". This expression, common in English since the seventeenth century, derives from the insult used by the English soldiers deployed in the Netherlands during the English-Dutch wars toward their Dutch counterparts, who they saw as unable to fight unless drunk, usually with gin (Purdy 2015). Liquid courage, however, dates back longer, to pre-modern times. Victor Davis Hanson, a prominent scholar of the Greek way of war, contends that a Greek hoplite marched into battle drunk and probably fought slightly inebriated. Wine could "stanch his fear, dull his sensitivity to physical injury and mental anguish, and make the awful task of facing an enemy phalanx that much easier" (2000, 121). Over the centuries, nations developed and adapted their specific drinks of choice. The Romans, just like later their Italian descendants, preferred wine. So did the modern French, though a standard wine provision replaced a small daily ration of distilled alcohol only early in the twentieth century. The Germans commonly issued beer, but also schnapps and wine. The Russians relied on a vodka allowance known as *charka* (125 milliliters), which was institutionalized in the eighteenth century. For their part, the Americans initially doled out rum, but switched to whiskey after the Civil War of 1861–1865 (Andreas 2020, 24–36; Dunbar-Miller 1984; Herlihy 2002, 56; Kamieński 2016a, 5–14, 19–21).

Perhaps best-known in the modern experience of war are the British rum rations during WWI. In the eighteenth century, rum replaced the earlier customary provisions of wine, beer, and brandy, but the practice was discontinued in the 1890s. However, when in September 1914 the British forces arrived at the Western Front, the regular allowance was reintroduced, justified exclusively on medical grounds as a remedy for fatigue, stress, and the hardships of arduous campaigning. The standard ration of thick, 80% proof "fatigue rum" was 2.5 ounces (about 70 milliliters), issued daily in the trenches. To give heart to men before they went over the top, a double portion was dispensed (Dunbar-Miller 1984; Holmes 2004, 329; Kamieński 2016a, 18–19, 2019).

Overall, wars have rarely been fought sober. For most of history, it was beyond question that soldiers must be routinely provided with "liquid courage". In 1777, at the height of the revolutionary struggle against Britain, general George Washington captured this common belief well: "the benefits arising from the moderate use of strong liquor have been experienced in all Armies and are not to be disputed" (in Gately 2008, 196). But soon they were challenged, for while moderately consumed alcohol can provide courage, when abused it might threaten to seriously ruin discipline and fighting power, as soldiers come to be "more interested in bottle than in battle" (Andreas 2020, 41). In fact, alcohol has caused problems to the military since antiquity and at times inopportune drinking led to defeats (Chafetz 1965, 20–23, 159). In modern times, armies increasingly struggled with drunkenness among the ranks, which already in the eighteenth century became a serious issue, for example, in the British armed forces. It was, however, in Russia that the consequences of heavy drinking were particularly devastating; following the 1917 revolution, the Bolsheviks launched an anti-alcohol crusade, deeming drunkenness counter-revolutionary. Yet, this temperance campaign was not a great success, and in late 1941 daily vodka allowances were reintroduced to hearten the Soviet troops to face the Wehrmacht (Kamieński 2016a, 15–16, 23).

WWII marked the beginning of the end of standard provisions of alcohol in soldiers' rations, though the US units deployed to fight in both Korea and Vietnam continued to receive their everyday allowance of beer (Andreas 2020, 63). Although modern militaries have sobered up, and although contemporary institutional military culture prohibits drinking, alcohol remains a popular, albeit no longer authorized, means of relieving the fear and stress of combat. Drinking for courage has been largely taken over by drinking to become

desensitized to the realities of combat, a pattern of motivation which involves a higher risk of abuse. For instance, it was misuse and abuse of alcohol that posed a greater challenge to discipline in the US ranks deployed to Vietnam than the widely publicized heroin or marijuana taking (Kuzmarov 2009, 35).

Moving on to non-alcoholic examples of lubricants of courage, the African Zulus owed their reputation as fearless warriors not only to their inborn belligerence. When conquering the Zululand in 1879, the British Army encountered an enemy who supported themselves with a wide spectrum of psychoactive alkaloids. These energized the warriors' bodies but also affected their minds, rendering the Zulus amazingly brave. Shamans provided them with herbs, such as *intelezi* (a traditional plant taken in purifying rites to boost group morale), medicated beer, *dagga* (the South African variety of cannabis which, initially after being taken, has a stimulating rather than sedative effect), and probably also the toadstool known as *Amanita muscaria* or "fly agaric" (Bryant 1949, 222; Kamieński 2016a, 84–88; Kan 2009, 47).

The mushroom was certainly for a long time in circulation among the warriors of the Siberian tribes of Chukchi, Kamchadals, Koryaks, Yakuts, and Yukaghirs. A raw *Amanita muscaria* has mild psychoactive effects, but when dried it develops potent neurotoxic properties (during the decarboxylation process one of its compounds, ibotenic acid, is converted into the muscimol alkaloid, which is a sedative-hypnotic agonist of the GABAA receptors in the brain's award system). The effects are both hallucinogenic and stimulating: the fungus boosts the brain, triggers the thirst for action (in particular provoking motor hyperactivity), and alters perception by generating the feeling of omnipotence (due to the effect known as micropsy, which makes the surroundings appear as diminished). Because the urine of the *Amanita* eater retains strong psychoactive properties, having had harmful toxins filtered out of it, urine drinking was very popular among the Siberian tribes and their warriors (Mann 2000, 221). Narratives say that the mycophilic tribes of *muscaria* lovers produced fierce, muscimol-triggered warriors. Similar effects were also documented in modern accounts. During the war between Sweden and Norway in 1814, some Swedish soldiers got high on *Amanita* and fought in "a raging madness, foaming at the mouth" (Wasson and Wasson 1957, 192). In 1945, a group of Soviet soldiers, presumably from Siberia, was reported as performing fearlessly while under the influence of "fly agaric" at the battle of Székesfehérvár in Hungary (Kamieński 2016a, 38–40; Rudgley 1993, 40–41).

If prior-to-battle pharmacopoeia has assisted in preparing soldiers for combat by relieving fear and fostering a fighting mood, it has also helped in empowering them and keeping them in line when the actual fighting starts.

Enhancing performance

The less prone to fatigue and collapse troops are, the greater their edge vis-à-vis the adversary. In pursuit of superior strength, fighting endurance, vigilance, and resilience, combatants have every now and then been reinforced with stimulants which reduce tiredness and the need to sleep, promote alertness, build up stamina and self-confidence, and suppress hunger. Uppers can not only maintain but also expand fighting effectiveness. Diverse substances have been used in this way to make for more efficient warriors, such as alcohol (in small amounts), caffeine, tobacco, coca and cocaine, cola nuts, khat, amphetamines and amphetamine-like stimulants (ATS) and nootropics.

In the nineteenth century, European militaries began to embrace what traditionally had been practiced by the Andean peoples and armies: chewing coca leaves for improved endurance. Then, in 1883, a Bavarian army physician, Theodore Aschenbrandt, carried out the

first experiments on soldiers with cocaine. He speculated that its appetite-inhibiting properties could help cut army food supplies by as much as 20% (Streatfeild 2002, 67). In the early twentieth century, mass-produced and in widespread use, cocaine found its way to the battlefield. It was not, however, its already common therapeutic application as a local anesthetic that proved most beneficial during WWI. Cocaine was both issued and taken unsupervised for enhancement, although the scale of this consumption remains impossible to estimate due to the lack of official records. Limited and often circumstantial evidence suggests that, blended with food rations, a powdery compound was dispensed by some of the belligerent armies to keep their units soldiering by improving their spirits and helping them stay awake and focused (Kamieński 2019).

Cocaine "fortified" early German and French pilots, who took it on long-distance sorties (Woods 1931, 42). The British Army made use of "Forced March", a mix of cocaine and cola nut extract. The medicine, part of the Tabloid brand products by Burroughs Wellcome & Co., was advertised to "allay hunger and prolong the power of endurance". One tablet "every hour when undergoing continued mental strain or physical exertion" was recommended (in Kamieński 2016a, 97). Having known that at the beginning of the twentieth century, "Forced March" had proven beneficial during polar expeditions, assisting Roald Amundsen and other explorers of Antarctica, the Army's command decided to made use of the product too. Thus, the British troops "imbibed these convenient pills, perhaps helping them endure the rigors of trench warfare" (Bourke 2010, 1817).

Early in WWI, the German Army Command intended to issue every soldier daily rations of cocaine to suppress their appetite and increase resilience, but the project was abandoned due to a limited stock of the drug (Hobhouse 2003, 230). However, when at the outset of WWII, a similar idea was devised, the military was well-equipped with a much more potent stimulant: methylamphetamine. Manufactured as Pervitin by the Berlin-based Temmler-Werke company and available in the market from 1938, it became a very popular supplement in German society. This early version of meth, which produced high- and long-lasting alertness, found its way also to the military (Ohler 2017, 34–48). Between April and December 1939, Temmler supplied the Wehrmacht with 29 million 3 mg Pervitin "assault" pills (Kemper 2002, 128). Large amounts were distributed to medical officers during the invasion of Poland in September 1939 to be tested to combat fatigue (Steinkamp 2007, 63). The Polish campaign turned out to be not only a dry run for the lightening offensive maneuver war of Blitzkrieg but also a battlefield experiment in the use of stimulants. The results were encouraging: Pervitin proved useful in keeping men alert and proficient (Beevor 2017; Ohler 2017, 62–66; Snelders and Pieters, 2011). Consequently, during the conquest of the Netherlands, Belgium, Luxemburg, and France in the spring of 1940, German troops were issued some 35 million tablets (Rasmussen 2008, 54). With its great speed and scope, the Blitzkrieg was "powered by amphetamines as much as it was powered by machine", with some soldiers taking up to four Pervitin pills a day for weeks on end (Rasmussen 2008, 54). Soon, however, meth's side-effects – such as hangover, nervousness and aggressiveness, addictiveness, and higher accident and suicide rates – were discovered. Its use was therefore limited and in December 1940, consumption dropped tenfold to 1.2 million pills a month (Nöldecke 2002; Ohler 2017, 143–148). Yet, the harsh winter conditions of the war against Russia in 1941 again brought increasing demands for the stimulant. Overall, based on the available data on average monthly supplies and use, it can be estimated that during the war the German military consumed some 200 million stimulant pills.

As in Nazi Germany, methamphetamine was the drug of choice in Japan, the country in which the compound was first synthesized in 1919. The most popular brand was Philopon (*hiropon*), produced by the Dai-Nippon Seiyaku Corporation. Coined from the Greek words

philo ("love") and *ponos* ("work"), it was trademarked in 1941 for its ability to arouse the urge to work. In fact, stimulants were issued not only to soldiers but also to civilians employed in war-related fields. The Emperor's Army distributed *senryoku zōkyōzai*, tablets which increased the fighting spirits and helped people stay awake. Believed to improve night-vision, they were known as *nekomejo* or "cat-eye pills". Kamikaze pilots received special "storming tablets" named *tokkojo*, which consisted of meth blended with green tea powder and stamped with the emperor's crest (Edström 2015, 522; Kan 2016, 156; Satō 2008, 720; Vaughn, Huang, and Ramirez 1995).

Britain and the United States also followed suit, employing amphetamine (*speed*): 5 mg Benzedrine tablets manufactured by the US Company Smith, Kline & French (SKF). In September 1941, the Royal Navy authorized its use, followed in November 1942 by the Royal Air Force and later also by the Army (Pugh 2017). The main consumers of Benzedrine were pilots, who took it to prevent performance degradation and ward off fatigue and drowsiness, especially during long nocturnal operations (thus the popular nickname: *wakey-wakey* pills). The British military used, in total, some 72 million speed tablets (Pugh 2018, 756; Rasmussen 2008, 71).

By 1942, Benzedrine (known in the United States as *benny*) was placed in emergency kits for American bomber crews, and in 1943 also for the infantry. Although doctors could not conclusively prove that amphetamine enhanced combat performance, servicemen found it beneficial in prolonging alertness, boosting confidence, and improving a sense of well-being. Rasmussen explains that "The drug was simply too useful for the military to do without, regardless of what science had to say" (Rasmussen 2008, 71). About 15% of US soldiers took *bennies* regularly. Research carried out at the end of the war in an American military hospital revealed that 25% of the patients abused amphetamine and 89% had taken it on a regular basis during their tour of duty (Bayer 1973). In the course of the war, American armed forces used between 250 and 500 million Benzedrine sulfate tablets. Estimating the precise number would depend on the government procurement price, which is unknown (Rasmussen 2008, 84).

WWII marked the beginning of the large-scale use of synthetic stimulants. As the American military continued to use speed, during the Korean War (1950–1953), the regular prescription of dextroamphetamine (Dexedrine) for combat was introduced and its administration became almost commonplace (Rasmussen 2008, 193). The scale of the military employment of amphetamine in the 1950s was astonishing, but it should be seen in the general context of the pervasive consumption of speed across American society, which caused Charles Jackson to call the United States the "amphetamine democracy" (1975). Speed-popping within the ranks persisted as the norm in the Vietnam War (1965–1973), when pep pills were distributed not only to men leaving for long-range reconnaissance missions and ambushes but more or less routinely in general. The extent of the state-sanctioned use of amphetamines was massive. In 1971, a report by the House Selected Committee on Crime revealed that in 1966–1969 the US forces in Vietnam used 225 million 5 mg Dexedrine pills (or statistically 30–40 tablets per fighting man per year) (Iversen 2008, 72; Kuzmarov 2009, 17; Rasmussen 2008, 190–191).

The practice of enhancing performance with amphetamines persisted, and during Operation Desert Storm in the Gulf War (1990–1991), 58% of American pilots enjoyed dextroamphetamine support, while 17% flew regularly on *go pills*, as the crews nicknamed their legal uppers (Kamieński 2016a, 269). Amphetamines continued to be employed among the US pilots for "fatigue management". Under a strict control regimen and specific procedures, Dexedrine was allowed for crews to keep them alert on lengthy missions. Jet and bomber pilots embarking on sorties longer than 8 hours (for single-pilot flights) or exceeding 12 hours (for two-person crews) could be prescribed 10 mg Dexedrine pills each time (*Performance*

2000). The use of the stimulant was voluntary; those crewmembers who opted for it were upon their return to base entitled to receive sedative, sleep-inducing *no-go pills* (e.g., Ambien or Restoril). In 2003, amphetamines began to be supplemented and then in 2017 replaced by modafinil (Provigil), the eugoric psychostimulant and a common lifestyle smart drug discovered in the late 1970s in France. It promotes a natural-seeming sense of wakefulness and mental acuity by selectively arousing the central nervous system and comes with the relatively small risks typically associated with amphetamines. The maximum allowed daily dose for the US pilots is 400 milligrams of modafinil (Baranski et al. 1998; Caldwell et al. 2004; Caldwell, Caldwell, and Schmidt 2008; Kamieński 2016a, 276–280; Pigeau et al. 1995). The US military today is, it seems, the only one that officially authorizes psychostimulants for fatigue management. However, in 2011 the Chinese military unveiled its own novel anti-sleep drug called "Night Eagle", reportedly enabling men to stay awake for up to 72 hours (Moreno 2012; Ye-seul 2011).

While regular armies have mostly abandoned prescribing intoxicants to build up combat performance, the irregulars have increasingly relied on them. Following Operation Iraqi Freedom in 2003, in which the US-led coalition forces overthrew Saddam Hussein's regime, some insurgents fighting the US forces were reported to be doped up on amphetamines and cocaine (Perry 2005). The terrorists of Lashar-e-Taiba, the anti-Indian jihadist militant group based in Pakistan, who perpetrated the November 2008 attacks in Mumbai, enhanced their effectiveness with cocaine and steroids, which enabled them to withstand the Indian special forces for nearly 60 hours (McElroy 2008). For their part, the Islamic State's fighters and terrorist suicide bombers have also been reported to boost themselves with drugs. The ISIS fighters in Syria took cocaine, meth, heroin, hashish, and opioid painkillers. Yet, the main battlefield catalyst for them was Captagon (fenethylline), a synthetic ATS invented in 1961 which is metabolized in the body to form two compounds: amphetamine and theophylline (El Khoury 2020; Kamieński 2016a, 233–238, 241; Kan 2016; Keefe 2016). The jihadists also drugged children to turn them into hardened and loyal fighters. This was not, however, a unique practice as intoxication is almost intrinsic to the child-soldiering phenomenon. Since the 1990s, from Sierra Leone to Afghanistan, Somalia to Iraq, and Liberia to Mexico, young soldiers have been given drugs (especially amphetamine, cocaine, and heroin) for various purposes, including to increase their risk-taking behavior and improve performance (Kamieński 2016a, 243–262).

Recently, advances in brain science and neurotechnologies offer new prospects that could supplement or even replace psychostimulants in combat. For example, magnetic, electrical, or focused ultrasound transcranial brain stimulation allow for various forms of enhancement, including greater alertness, concentration, and learning skills. Already in 2016, the US Navy Special Warfare Development Group (Seal Team 6) began testing a brain-stimulating headset device developed for athletes by the Halo Neuroscience Company. The trials proved promising, as personnel could train faster with the same results, or at the same pace but for much better outcomes, be it operating weapons, movement-based combat skills, or decision making (Brown 2017; Seck 2017; Halo Neuroscience).

To sum up, throughout history, stimulants have served as a means for expanding fighters' physiological and cognitive abilities and thwarting fatigue.

Mitigating the mental burden of combat

The long-term effects of battle experience can have severe effects on the mental health of service members, including post-traumatic stress disorder (PTSD). Traditional methods for

avoiding reactions to combat anxiety and preventing mental breakdowns, such as the psychological screening of candidates, tough training, psychiatric services on the frontline, and deployment rotation, have been supplemented with drugs. Depressants have been particularly popular in helping combatants cope with the psychological burden of soldiering. To this end, in the aftermath of battle, alcohol was often issued and troops additionally rewarded themselves with the stocks they had looted. Soldiers and veterans suffering from psychiatric disturbances have often self-medicated. Intoxication to relieve the pain of combat has a very long history. In the *Odyssey*, Homer describes how the grief and sorrow felt for companions who died in the Trojan War were drowned in *nepenthe*, most likely the tincture of opium and wine (Gahlinger 2004, 19; Homer 2002, 4.219–227, 12). In the nineteenth century, and especially during the American Civil War and the Franco-Prussian War (1870–1871), opium and morphine were dispensed liberally for their soothing effects not only on the body (as palliatives) but also on the psyche (as depressants). The psychological costs of fighting expanded with the growing scale, intensity, and mechanization of the modern battlefield. During the Vietnam War, the routine prescription of potent antipsychotic drugs (sedatives and neuroleptics, including an antipsychotic chlorpromazine) was supplemented by widespread self-intoxication by the servicemen, most commonly with alcohol, marijuana, and smokable heroin. As many as 37% of US soldiers in Vietnam who took drugs reported doing so to forget the killing and relieve the mental strain (Kuzmarov 2009, 22). Alcohol apart, the most popular self-prescribed drugs were marijuana, heroin, opium, sedatives, hallucinogens (mainly LSD), and (meth)amphetamine. Heroin, in particular, became a severe and widespread problem: in 1971, it was estimated that as many as 15% of the troops were addicted to this narcotic (Booth 1998, 272; Kamieński 2016a, 195).

In the early twenty-first century, the asymmetrical character of the wars in Afghanistan and Iraq burdened soldiers with severe stress. Insurgency and urban warfare, as well as the traumatic experience of death and injuries caused by irregular forces resulted in a significant increase in the number of US servicemen suffering from serious mental disorders (on average 11% of those returning from Afghanistan and 17% of those serving in Iraq) (Hoge et al. 2004, 13). In April 2008, there were approximately 303,000 Afghanistan and Iraq veterans diagnosed with PTSD or other severe disorders (Tanielian and Jaycox 2008, XXI). Soldiers with psychic problems on the frontline were routinely administered psychotropic drugs to quickly restore them to combat readiness. The increase in prescription medications issued to personnel was extensive. Steve Robinson, an intelligence analyst at the Department of Defense under President Bill Clinton's administration, reported that soldiers he talked to "were receiving bags of antidepressants and sleeping meds in Iraq, but not the trauma care they needed" (in Allen 2006). In 2009, some 106,000 ground force servicemen were prescribed psychotropic antidepressants or analgesics (McKinley 2010). A black market for prescription medications also emerged with Valium (diazepam) being particularly popular among troops in Iraq (Allen 2006).

The psychological costs of these conflicts also triggered new research on pharmaceuticals that could alleviate or even prevent combat-induced anxieties and PTSD. Propranolol, a popular beta-blocker used for heart and circulatory conditions, has been intensively investigated for this purpose. Results have been promising, as blocking beta-adrenergic receptors in the brain can suppress the creation of bad emotional memories and subsequently avert anxiety disorders (Kamieński 2013). So far, however, these drugs have not been recommended for the pharmaco-prevention of combat stress and anxiety disorders.

To conclude, both prescribed and self-administered psychoactive substances have assisted combatants in coping with the stress of battle and lessening the psychological experience of fighting, killing, and the presence of death.

Facilitating camaraderie and relieving boredom

The major motivational factor in terms of understanding why soldiers fight is not grand ideas or sentiments like patriotism or nationalism, but their companions (McClure and Broughton 2000, 482–483; Wong et al. 2003). Thus, primary group bonds, close relations within a small military unit, usually at the platoon level, are crucial for morale and fighting spirit. One of the activities that can foster social bonds is the collective taking of drugs. A shared experience of intoxication might be meaningful, and enhance group cohesion. Alcohol is the most common ice breaker. By increasing forthrightness between soldiers, it can facilitate camaraderie. One observer commented on the American War of Independence of 1775–1783 that "without New England rum, a New England army could not be kept together" (in Gately 2008, 195). Group drinking strengthens ties and builds trust, which is vital for the operation of a unit. This socialization function has also been performed by other intoxicants. For instance, before going into battle, the Zulus performed preparation rituals intended to fortify them. Shamans gave warriors psychoactive plants, one of which induced communal vomiting expected not only to purify men but also to bring them together "as a strong fighting force" (Kamieński 2016a, 85). Another example is the newcomer American GIs in Vietnam, for whom drug-taking was often a mandatory part of their initiation and socialization, so that smoking marijuana and heroin frequently took on the form of a ritual, being more of a group than a private experience (Kamieński 2016a, 201).

While fostering social bonding through shared intoxication can ultimately promote better combat performance, it also helps pass the time in periods of military inactivity. For over 300 years, one of the most popular antidotes to boredom has been tobacco, which is also very useful for both relaxing and stimulating the smoker (Andreas 2020, 68–100). The consequences of acute boredom, inherent in the very experience of war, can be debilitating (Mæland and Brunstad 2009) and were particularly vivid in Vietnam. In his memoir of this war, *A Rumor of War*, Philip Caputo recalls: "nine-tenths of war is waiting around for the remaining one-tenth to happen" (1996, 43). During the Soviet Afghan War (1979–1989), the Red Army soldiers also extensively reached out for intoxicants to relieve boredom. Alcohol was expensive and difficult to obtain, so hashish (locally known as *plant*), marihuana (*anasha*), and opium (*khan/chars*) were popular. Heroin and cocaine were also taken. Additionally, soldiers sampled local brands, including partly refined opium (used to produce heroin), *koknar* (a brew of boiled poppy heads), and *cheffir* (very strong tea) (Kamieński 2016a, 220–227; Reese 2000, 173). Overall, being a remedy for utter monotony, the recreational use of drugs has helped combatants remain sane.

The search for psychoactive weapons

Mind-altering substances have been employed to make soldiers stronger, faster, more resilient, and desensitized. If drugs can make humans more machine-like, then maybe intoxicants themselves can be weaponized into chemical tools of war. Disorientation, indecisiveness, hallucinations, sluggishness, seizures, and other similar intoxication-induced effects offer, potentially, highly desirable military capacity. Thus since pre-modern times, there have been attempts to use toxic plants and psychoactive ingredients (such as atropine, opium, and cannabis) as weapons, albeit non-lethal ones – that is, aimed not to kill but to confuse, disrupt, and immobilize an enemy, or overpower the populations in which they are nested. It is important to realize that weaponization entails more than technical capability, as it is closely entwined with the assignment of a coercive intentionality to an object (a psychoactive

substance). Conceptually and practically, the making of a psychotropic NLW demands a twofold reconfiguration of both chemical weapons (their de-lethalization) and non-lethality (expanding the realm of mind control). Thus, militarization provides a new, violent deconstruction by instilling a different logic of functionality which, in the case of intoxicating compounds, encompasses their utility and effects as well as perception and meaning.

From cannabis to atropine to opium

2,500 years ago, the Chaldeans would set heaps of Indian cannabis on fire, thereby trying to strip their opponent of fighting power with incapacitating smoke. This method, however, was sometimes counterproductive; when the wind boomeranged, the smoke impaired the functioning of the Chaldeans themselves (Kamieński 2016a, 169). Atropine contained in *Solanaceae* plants was another substance employed to subdue the enemy without fighting. Its intoxication induces mental and behavioral impairment, including sensory inebriation, disorientation, confusion, loss of time-space relationships, illusions, and hallucinations. In 1962, Ephraim Goodman, a US Army Chemical Corps employee, penned a review of both the accidental and deliberate use of atropine and its derivates for military purposes (2010). Based on extensive library research, his manuscript was to substantiate the Corps' Cold War search for psychochemical weapons. Goodman provided a handful of examples. Around 200 BC, the Carthaginian commander Maharbal, knowing of a rebellious African tribe's fondness for wine, authorized the mixing of it with mandrake (a perennial containing atropine) and had it left in a deserted camp. When the Africans returned and drank the toxic beverage, they became disabled by atropine-induced psychedelic psychosis and were defeated by Maharbal's lurking men (Goodman 2010, 53–54; Ketchum 2006, 14). Similarly, "a standard Roman military stratagem" was to inebriate barbaric foes before ruthlessly defeating them (Andreas 2020, 18–19; Gately 2008, 38). Very few documented instances of the use of atropine for military purposes can be found in the Middle Ages. A huge historical gap in evidence follows until the seventeenth century. In 1667, during the Bacon Rebellion of Virginia settlers against the colonial governor, the British soldiers sent to crush the uprising in Williamsburg unwittingly poisoned themselves with the local plant known as James-Town Weed or jimsonweed (*Datura stramonium*). They were rendered ineffective, spending 11 days in altered states of mind (Beverley 1705, 24). An early attempt to disseminate aerosolized belladonna dates back to July 1672 and the assault on the city of Gröningen by the troops of the Bishop of Münster, Bernhard von Galen, who used crude grenades filled with the incapacitating alkaloid. The technique proved ineffective as "the heat of combustion probably destroyed active principles of vegetable poisons employed in shells" (Goodman 2010, 59). As for more modern examples, in 1881 a French unit traveling through the desert from Sudan to Algeria was poisoned with atropine by the Touareg warriors, so that the troops were debilitated by hallucinogenic delirium (Goodman 2010, 55–57). Then in 1908, 200 French troops were poisoned in Hanoi in French Indo-China by plotting Chinese reformers: "One of the intoxicated soldiers saw ants on his bed, a second fled to a tree to escape from an hallucinated tiger, and a third took aim at birds in the sky" (Goodman 2010, 57).

Moving on to WWI, and from atropine to opium, prior to an attack in the third battle of Gaza, in October–November 1917, the British General Edmund Allenby authorized the airdrop of cigarettes laced with opium on Turkish positions in Palestine. This subversive ploy was reported to "render the Turkish troops immobile" (Meinertzhagen 1960, 223–224). They probably resembled the Chinese soldiers of the mid-nineteenth century who were made unfit for duty by their pervasive opium-smoking. Many infantrymen fighting in the

Opium Wars (1839–1842 and 1856–1860) to defend the country against the flood of the smuggled drug supplied by the British East India Company were themselves heavy addicts. In fact, one explanation for the success of the Taiping Rebellion, which took power in southern China in 1851, is the epidemic addiction rates of up to 90% that afflicted the ranks of the Emperor's Army. The rampant use of opium caused general weakness, apathy, and broken discipline (Hanes and Sanello 2002, 171; Zheng 2005, 88–96). The question that intrigued some militaries in the second half of the twentieth century was whether similar effects could be achieved by the deliberate use of militarized intoxicants.

The Cold War quest for psychotoxic arsenals

After WWII, the US intelligence warned that the communists were investigating the utility of intoxicants, allegedly in preparation for psychochemical warfare. In 1951, it stated that the Soviets were experimenting with an unidentified psychotropic drug referred to as "ketjubung" (Ketchum 2006, 245–246). They were reportedly also collecting large stocks of ergot (*Claviceps purpurea*), the fungus which is parasitic in grains (mostly rye) and can be synthesized into LSD (Albarelli 2011, 375). However, these concerns over the communist military's psychoactive capabilities proved as unsubstantiated as the parallel alarmist intel that they had mastered narcotic-induced brainwashing methods, and already used them on American prisoners of the Korean War. Although imaginary, the problem triggered the United States to embark on a psychopharmacological arms race and research on weaponizing intoxicating compounds (Carruthers 2009, 174–216; Streatfeild 2007, 1–28). Other nations, including the British, Soviets, and Czechoslovakians, also joined in and experimented with hallucinogens for military applications.

In 1949, in a document entitled *Psychochemical Warfare: A New Concept of War*, Luther Wilson Greene, the technical director of the laboratories at Edgewood Arsenal, the US Army Chemical Corps' facility in Maryland, called for a doctrine of "bloodless warfare". Exposing the enemy to the effects of incapacitating agents, Greene argued, would knock them back with attacks of delusion, panic, or hysteria and thereby weaken their will to resist (Khatchadourian 2012). This prospect was taken further in the mid-1950s by the head of the Corps, Major General William Creasy. Overwhelmed by the idea of hallucinogenic weapons, he advanced the concept of "war without casualties", in which an impairing cloud dispersed over the enemy paralyzes but does not kill even the most elite units (1959, 74 f).

Although in the 1950s no effective offensive neurochemical capability existed, the idea of psychotoxic munition was not utterly fantastic because history had shown that intoxication could impede combat performance. For example, during the Egyptian campaign (1798–1801), Napoleon Bonaparte's forces developed a habit of using hashish, locally a highly popular extract from the resin of the cannabis plant. The effects of hashish-eating for the fighting efficiency of the French soldiers were so devastating, with men wasted by laziness and sluggishness, that the French authorities decided to introduce a total ban on the drug in Egypt (Kamieński 2016a, 53–54; Guba 2020, 49–82).

On other occasions, however, claims that a narcotic problem had destroyed combat readiness were mere allegations. During WWI, cocaine use was prevalent in both France and Britain; yet, they both blamed Germany of smuggling it into their cities and trenches to subvert their war effort. In 1916, a French deputy fulminated: "It seems that the Germans can't beat us with their fire or their asphyxiating gas, so now (…) they're using cocaine and morphine to wear us down" (in Padwa 2005, 340). It was, however, in Britain that this Germanophobic psychosis erupted into a nationwide drug scare. The overblown problem was

presented as a deadly threat to the Empire. Allegedly, the drug-crazed soldiers on the front had become unpredictable and insubordinate. Turned into a cliché as part of a wartime conspiracy theory, cocaine became associated with hostile subversion, fostering the false myth of German drug sabotage (Berridge 1984; Kamieński 2019; Kohn 1999). Still, the deliberate circulation of drugs among an opponent's forces and population could weaken their capabilities and morale, which, in fact, made for an actual US tactic in the 1980s, when a network of dealers distributed narcotics, confiscated in the United States by law enforcement agencies, among the Soviet soldiers deployed in Afghanistan. Turning them into addicts was supposed to erode their operational capacity (Cooley 2000, 128–129). Another telling example of a narcotic myth is the Vietnam War. Because marijuana was the most common non-alcoholic drug ordinarily self-prescribed by the US soldiers, the media blamed it for the failure to win the war. Cannabis was described as a plague tormenting American troops, but the story was made up as no compelling evidence existed that marijuana smoking presented a serious obstacle to effective combat (Kuzmarov 2009).

If substance use and abuse was, sometimes falsely, believed to deteriorate military performance, an intentional deployment of hallucinogenic intoxicants could perhaps offer an immense offensive capability. The US Chemical Corps could have reasonably assumed, then, that the weaponization of psychoactive agents might prove an effective means for impairing the faculties of an adversary. Thus began the search for compounds that could feasibly enable combat through mind control, a quest for ingredients which could be dispersed over hostile forces, added to their food, or dissolved in water to deprive them of elementary fighting abilities. In its attempt to unlock the military potentials of psychotoxins, from 1955 to 1975, the Corps conducted experiments on humans. They were mainly carried out in Edgewood but also at other army bases and in army-commissioned hospitals, penitentiaries, and universities, including Baylor University, the University of Pennsylvania, Tulane University, Johns Hopkins University, and universities in Indiana, Utah, and Washington (Hornblum 1998, 131). The staff at Edgewood had no problems with recruiting volunteers, the majority of whom were drawn from among the soldiery. Many enrolled several times, encouraged by incentives such as extra pay, free three-day weekends, or relocation closer to home (Ketchum 2006, 51, 253).

The participants underwent medical screening and completed the Minnesota Multiphase Personality Inventory psychological test to reveal any mental problems. Before signing a mandatory informed consent form, each participant was required to be notified of the character and aims of the experiment (Ketchum 2006, 25, 32–33, 58). However, the staff were often not fully aware of effects of the substances to be tested, particularly when these were samples of "rejects" from the pharmaceutical industry, i.e., the compounds deemed unfit for medical commercialization. This was the case, for example, with benzilate: created in 1951 by Hoffmann-La Roche during its search for the treatment for ulcers, the compound was rejected as unsuitable due to its strongly hallucinogenic effects (Kamieński 2016a, 178). Furthermore, most of the psychoactive agents that underwent trials on humans had no name and the pharmacological terms or codenames associated with the rest meant nothing to the subjects. Hence, it was often assumed that providing participants with specific information was redundant. Dr. Gerald Klee, one of the psychiatrists involved in the program, explained that most of the volunteers "were not highly educated, and even if they had been told exactly what they were to be given, they wouldn't have understood it" (in Bowart 1978, 91). These circumstances raised concerns regarding the subjects' awareness of what they were exposed to and provoked questions as to whether they were not, to some extent, "guinea pigs". The huge battery of substances that was tested on humans under the Corp's scheme included

amphetamines, atropine, 3-quinuclidinyl benzilate (BZ), LSD, mescaline, morphine, and psilocybin (Moreno 2001, 251). Marijuana, LSD, and BZ seemed particularly promising.

Experiments with liquid concentrate cannabis had already been conducted in 1943 on Manhattan Project officials (Moreno 2001, 191). Then in the late 1950s, the Corps ran human trials with a super-concentrated hash "red oil", a substance codenamed EA1476. Studies demonstrated that it could induce strong intoxication and deprive smirking soldiers of their combat skills. In 1961, a series of studies with a synthetic, pure, and undiluted analog of tetrahydrocannabinol (THC), the principal psychoactive constituent of cannabis, were carried out. Codenamed EA2233, this new cannabinoid compound was a mixture of eight stereoisomers (different spatial orientations of atoms of the same molecule) of THC. Compared with "red oil", its intoxicating effect was much stronger and longer-lasting. When in 1965 individual isomers of EA2233 became available, another series of trials was conducted with the improved version of the THC analog. The knockdown effect left subjects almost unable to move. Further experiments were thus suspended due to the health hazards. So, as the full potential of cannabinoid isomers was never investigated, a window of opportunity may still be open. As James Ketchum, the first and leading psychiatrist in the research program at Edgewood, later recalled: "This hypotensive (blood-pressure-reducing) property, in an otherwise non-lethal compound, might be an ideal way to produce a temporary inability to fight, or do much else, without toxicological danger to life" (in Lee 2008).

Another candidate for weaponization to be exploited was LSD, codenamed EA1729. The Army program of testing it on human subjects commenced in 1955 and was conducted on military and civilian personnel recruited from Army areas, mostly Edgewood (Ablard 1975). The research involved administering the drug to the servicemen orally, diluted in a liquid, prior to routine training. The general psychoactive effect on the subjects was that of being so overpowered by uncontrollable giggling and cackling that they ceased to be able to carry out even the most basic tasks (Bowart, 1978; Ketchum 2006, 99). Should this happen to an enemy, it could literally be defeated by laughter. Hence, the Army was interested in mastering effective dispersal methods that would allow it to throw "acid rain" down on enemy units and civilian populations. But the search for weaponized LSD was seriously hampered by the technical obstacles in the way of finding a suitable form, the proper dosage (in a gaseous form, LSD is three times weaker than when administered orally), and accurate means of delivery. Beginning in 1963, experiments with LSD in gaseous form aimed at designing effective methods for its aerosol dispersal were carried out. Edgewood's personnel conducted field trials at locations such as Fort Bragg (North Carolina, 1958), Fort Benning (Georgia, 1960), Fort McClellan (Alabama, 1959–1960), and Aberdeen Proving Ground (Utah 1959) (Ablard 1975, 12). Overall, about 90% of the LSD trials were conducted before 1961.

Later, around 1966, the Corps became more interested in BZ (or "Agent Buzz", codenamed EA2277) (Ketchum 2006, 244, 327). While the incapacitating effect of LSD lasts for up to 12 hours, for BZ it can be up to 80 hours (Ketchum 2006, 24, 43–47, 52). The compound induces delirium that can knock a person down, so it was an ideal candidate for weaponization. Between 1959 and 1975, BZ was tested in clinical trials on 2,800 soldiers both at Edgewood and in field experiments. In 1964, one such trial was conducted on a desert range in Utah, which entailed the spraying of Agent Buzz from a distance of 500 and 1,000 yards from the volunteer soldiers (Lee and Shlain 1992, 41). One of the aims of the whole research project at Edgewood was to find antidotes for the incapacitating agents and build defensive measures against hostile psychopharmacological attacks. Surprisingly, it was discovered that when in the correct dose, atropine, which throughout the centuries was used in military settings as an offensive debilitating substance, can be an effective antidote to Agent

BZ (Ketchum 2006, 109–116). In 1961–1962, benzilate was standardized as an incapacitating chemical weapon into an assortment of clustered munitions for aerosol delivery via grenades, mortars, cluster bombs, and rocket warheads, and adopted by the US Army. Never used in combat, in 1977, it was declared obsolete (Kirby 2006, 2007, 43).

On the whole, the pursuit of mind-breaking, intoxicating ammunition has failed. The plans for spraying an enemy with "deranging gas" or polluting their supplies with "psychotoxic water" remained largely confined to the realm of visions. Still, the notion of soft psychoactive violence continues to inspire research, as revealed by the idea for the non-lethal cannabinoid formula patented in 2017.

Conclusion

Throughout history, and particularly in the twentieth century, the matrix of psychoactive pharmacopeia and warfare was shaped by two overarching themes. The first is the disobedience as regards social norms revealed by illegitimate self-medication. The second is, by contrast, the compliance with the institutional rules and/or informal sanctions epitomized in the purposeful administration of intoxicants. These state-approved and reinforced military drug practices have been an exceptional thread in the general history of intoxicants and intoxication. Substance use, when synchronized with military/state goals, has been constructed not in terms of deviant behaviors but in a context of permissiveness. Hence, from a sociological perspective, the relationship between the individual (combatant), social group (the military), and behavior (the use of drugs) has been structured along the lines of normality. Above all, the social construction of intoxicants/intoxication and war has been shaped by the power interests of state institutions. By dispensing psychoactive substances to combatants, the authorities have managed their bodies (so as to optimize and increase performative and productive capacities) and exploited them (by conducting experiments on humans to weaponize psychochemicals). Thus, drugs in warfare might be seen as a specific politico-military antropotechnology, or "technology of the body". Likewise, anti-drug policies, control mechanisms, and penalization can be analyzed in terms of "technologies for disciplining the body". Therefore, it is instrumentality, the logic of the means-end relationship, that has marked the predominant socio-contextual meaning of intoxicants in military affairs.

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