

The Evolution of Poison Use in Hunting, Warfare, and Covert Operations

Douglas C. Youvan

doug@youvan.com

August 7, 2023

From prehistoric hunters using natural toxins to the CIA's MK-NAOMI program developing highly sophisticated chemical agents, the history of poison use has intertwined with human evolution. This comprehensive review explores this deadly legacy, unearthing the pivotal role of poisons in hunting, warfare, and clandestine operations. As we delve into high-profile assassinations involving substances like polonium-210 and VX nerve agent, the narrative underscores the urgent need for ethical scrutiny and robust legal frameworks to regulate the use of such potent tools.

Keywords: Prehistoric hunting, poison, toxins, ancient civilizations, Scythians, Han Dynasty, Middle Ages, blowguns, modern warfare, CIA, MK-NAOMI, Cold War, polonium-210, VX nerve agent, radioisotopes, chemical assassinations, ethical considerations, legal frameworks, technological advancements.

Introduction

Poison, a term derived from the Latin word 'potare,' meaning 'to drink,' has been an instrumental tool in human history, serving a myriad of purposes from hunting to warfare and political assassinations. This potent compound, whether derived from natural sources or synthetically created, has been wielded with deadly precision across the eons, its usage evolving alongside human civilization itself. Throughout this comprehensive exploration, we will delve into the history of poison use, traversing through prehistoric landscapes to the contemporary digital age, offering a panoramic view of this lethal weapon's changing roles.

The first usage of poison by our prehistoric ancestors was driven by the simple necessity of survival. It allowed them to level the playing field against larger, stronger prey, enhancing their hunting capabilities. In the case of ancient civilizations like Egypt, Greece, and Rome, poisons played integral roles not only in hunting but also in warfare, medicine, and political machinations. This trend was not limited to one region, as evidence suggests that cultures worldwide independently discovered and harnessed the power of these toxic substances.

As we journey through the Middle Ages and into the Early Modern Era, we will see how the application of poison became more sophisticated and strategic, making it a preferred choice for covert operations and assassinations. Moving into the 20th century and beyond, the use of poison has been revolutionized with the advent of advanced chemistry and technology. This has led to the creation of biochemical weapons and even the use of radioisotopes, introducing a new level of complexity and potential devastation to the use of these substances.

To fully comprehend the implications and consequences of the use of poison, it is essential to delve into the various biological,

medical, and physicochemical aspects that underpin its workings. Understanding the mechanisms of toxicity, the pharmacodynamics and pharmacokinetics of different poisons, and the intricate ways in which they interact with biological systems will provide a deeper insight into their historical and contemporary uses.

The persistent presence of poison throughout human history and its continued use today, albeit often illegally and unethically, underlines its enduring relevance. As we look ahead, the inevitable advancements in technology and biochemistry prompt us to consider the future trajectory of poison use and its potential implications for global security and ethics. As we embark on this comprehensive exploration of poison's historical trajectory, we will grapple with the delicate interplay between science, technology, and the darker side of human ingenuity.

Prehistoric Era

The prehistoric era marks the dawn of human innovation, a time when our ancestors first tapped into the power of natural resources for their survival, notably utilizing poisons for hunting. The evidence supporting this ancient use of toxins is primarily gleaned from archaeological findings and anthropological research.

One of the earliest instances of poison use dates back approximately 20,000 years to the Upper Paleolithic period. In South Africa, archaeological excavations at the Border Cave in the Lebombo Mountains have unearthed wooden applicators, seemingly used for delivering poison onto projectile tips. These applicators contained traces of compounds likely extracted from plants in the *Acokanthera* genus, known for their potent cardiac glycosides, a class of organic compounds notorious for their

heart-stopping capabilities. These compounds disrupt the function of cardiac muscle cells by inhibiting the sodium-potassium ATPase pump, leading to cardiac arrest – a clear demonstration of the sophisticated knowledge these early humans possessed about the toxicological properties of their environment.

Anthropological studies, particularly those examining indigenous societies, provide further insights into the early use of poisons. These groups often passed knowledge of venomous and poisonous species down through generations. For instance, some indigenous tribes in Australia have a long tradition of using the poison from certain types of frogs or toads to enhance the lethality of their weapons. Such practices speak to an intimate understanding of their natural environment and how to exploit it for survival.

Fossilized remains and cave paintings also provide indirect evidence of early poison use. Arrowheads and dart tips found at numerous archaeological sites suggest that they may have been used with poison. In France, the Lascaux cave paintings, which are around 17,000 years old, depict a human figure with a bird head near a possibly wounded bison, with a line possibly indicating a projectile extending from the bison. Some researchers interpret this as evidence of poisoned weapons being used in hunting.

These prehistoric individuals demonstrated remarkable resourcefulness and ingenuity in their hunting strategies. Their understanding of poisons, gleaned through careful observation of their natural surroundings, would lay the groundwork for the millennia of toxicological development to come. By harnessing the lethal potential of their environment, these early humans were able to compete in a challenging world, marking the initial chapter in our ongoing relationship with poison.

Ancient Civilizations: Egypt, Greece, and Rome

As we shift from prehistory into recorded history, our understanding of poison use becomes clearer, thanks to the preserved texts, artifacts, and accounts from the civilizations of Egypt, Greece, and Rome. These ancient societies not only employed poisons in hunting but also used them in warfare, political intrigue, and even medicine, leading to a complex legacy of poison usage.

In ancient Egypt, we find some of the earliest documented uses of poison. The Ebers Papyrus, one of the oldest and most important medical papyri of ancient Egypt dating back to around 1500 BCE, contains references to a variety of poisonous plants, such as mandrake and hemlock, indicating their awareness and potential use of these toxic substances. It is believed that they used these poisons for hunting and possibly warfare. Hieroglyphics depicting fowling, the hunt for birds, show arrows being dipped in a jar, which some scholars interpret as the application of poison.

The ancient Greeks also harnessed the power of poison, with well-known figures such as Hippocrates, the father of medicine, studying toxic plants. They were known to use various poisonous plant substances like hellebore and aconite in their arrows for warfare and hunting. The toxicity of these substances, due to alkaloids like aconitine in aconite, could cause paralysis, cardiac arrest, and death. However, Greek knowledge of poisons wasn't restricted to warfare or hunting; they also explored its medicinal use, creating a paradoxical image of poison as both a killer and a cure.

Rome's history with poison is well-documented, especially concerning its role in political assassinations. Some notorious figures like the infamous Locusta, a professional poisoner allegedly employed by Nero, highlight the dark side of poison use.

However, the Romans also used poisons for hunting and warfare. Pliny the Elder, a Roman author, and naturalist wrote extensively about toxic plants and animals in his work "Natural History." Toxic substances from plants, like hellebore, and animals, such as the venom of the Mediterranean scorpion, were used to poison enemy water supplies and smear on projectile points.

Overall, the civilizations of ancient Egypt, Greece, and Rome demonstrated a sophisticated understanding of poison, integrating its use into various aspects of their societies. Their exploration of toxicology laid the foundation for the later scientific study of poisons, contributing significantly to the legacy of poison use throughout human history.

Scythians and the Nomadic Warriors

The Scythians, fierce nomadic warriors of the Eurasian steppes, are famous for their extensive use of poisons, particularly in warfare. Herodotus, the Greek historian known as the 'Father of History', provides a detailed account of their toxicological prowess in his work 'Histories.'

According to Herodotus, the Scythians used an elaborate and lethal mixture for their arrowheads, combining snake venom with human blood and other ingredients to create a substance that was highly toxic. This complex concoction was believed to cause festering, necrosis, and a rapid, agonizing death if it entered the bloodstream. The methodology by which the Scythians prepared this poison showcases their advanced understanding of toxicology.

First, the Scythians would collect venom from venomous snakes by forcing them into a state of fear and aggression, making them secrete their deadly toxin. This venom was then mixed with

decomposed human blood left to putrefy over time. This combination was thought to induce sepsis upon entering a wound, leading to systemic infection and death.

The Scythians were also known to add the sap of certain poisonous plants to their venom-blood mixture, further enhancing its toxicity. This demonstrated their deep knowledge of the local flora and the dangerous properties of these plants.

The Scythians would then apply this deadly mixture to their arrow tips, making their already formidable archery skills even more lethal. The victims of these poisoned arrows were often left with festering wounds that would not heal, ultimately leading to their death.

Their use of poison was so infamous that it was said to have affected the tactics of their enemies, who were hesitant to engage them in combat. Even Alexander the Great was reported to have altered his strategy during his campaign against the Scythians, due to his fear of their poisoned weapons.

The practices of the Scythians illustrate the strategic importance of poison in warfare among the ancient nomadic tribes. By harnessing the lethal properties of their environment, they were able to develop a weapon system that instilled fear in their enemies and helped them dominate the Eurasian steppes for centuries. Their innovative use of poison underscores the role of toxicology in shaping historical outcomes.

Han Dynasty and the Chinese Warlords

In the vast expanse of China's history, the Han Dynasty, spanning from 206 BCE to 220 CE, stands as a particularly influential period, especially concerning military strategy and the use of poison. Chinese warlords and soldiers of this era harnessed the

toxic elements of their environment, notably incorporating poison-tipped arrows into their arsenal, a tactic that significantly impacted their warfare approach.

The application of poison in warfare and hunting was not an unfamiliar concept in ancient China. China's diverse flora and fauna provided a plethora of natural poisons. For instance, aconitum, or wolfsbane, a plant with highly toxic alkaloids, was a common source. Other toxic substances came from venomous creatures like snakes or centipedes.

Chinese warriors of the Han Dynasty were known for their distinctive crossbow mechanism, a unique invention that vastly improved the range and force of their projectiles. When these powerful weapons were paired with poison-tipped arrows, they became even more formidable. These poisoned projectiles could incapacitate or kill adversaries, often causing necrosis, paralysis, or organ failure, depending on the type of poison used.

The application of poison was not merely a practical affair. It also involved ritualistic elements, with specific rites conducted during the poison's application onto the arrows. This process hints at a cultural dimension to the use of poison, indicating its perceived power and danger, and its potential to alter the course of conflicts.

Furthermore, ancient Chinese texts like the 'Huainanzi' and 'Records of the Grand Historian' even contain references to the use of poisonous insects and animals in warfare, suggesting the development of early forms of biological warfare.

The influence of the Han Dynasty's use of poison extended beyond the battlefield. Traditional Chinese Medicine (TCM) incorporated knowledge of poisons for therapeutic purposes. The TCM principle of using small doses of toxic substances to treat certain ailments can be seen as an early exploration into toxicology and pharmacology.

Overall, the use of poison during the Han Dynasty, whether in warfare or medicine, underscores the duality of poisons - as both agents of death and potential sources of healing. It also highlights the critical role of toxicology in shaping not just military strategy, but also the scientific and cultural landscape of one of the world's oldest civilizations.

Middle Ages: Poisoned Bolts and Assassinations

The Middle Ages, spanning roughly from the 5th to the 15th century CE, saw a notable surge in the use of poison for military and political purposes in Europe and the Middle East. A critical development during this era was the use of poison-tipped bolts, primarily deployed from crossbows, a weapon that was gaining prominence across medieval battlefields.

Crossbows were powerful weapons, capable of penetrating armor and requiring less training to use effectively than traditional bows. When combined with poison, their lethality was substantially enhanced. In a period when medical knowledge was rudimentary and wound infections were a common cause of death, a wound from a poisoned bolt was often fatal.

Venoms from various venomous creatures were commonly used to poison these bolts. Snake venom was a popular choice, as were venoms from other creatures such as spiders or scorpions. Additionally, plant-based poisons, such as deadly nightshade (*Atropa belladonna*), hemlock (*Conium maculatum*), and hellebore (*Veratrum* species), were also used. The knowledge of these poisons was often closely guarded, passed down through generations, or held by specific guilds or orders.

Beyond the battlefield, the Middle Ages saw a rise in poison's use for political assassinations. Royal courts throughout Europe and

the Middle East were rife with intrigue, and poison became a favored tool for removing political rivals discretely. The infamous Borgia family of Renaissance Italy, for instance, was reputed to have eliminated rivals with a "Cantarella" - a poison rumored to be derived from arsenic.

In the Middle East during the Crusades, the shadowy Order of Assassins, or the Nizari Ismailis, became known for their use of poison in assassinations. They would often employ subtle and stealthy means, such as poisoned food or drink, to eliminate targets.

These trends highlight how, during the Middle Ages, knowledge of poisons and their application became a powerful and feared tool, both in open warfare and the shadowy world of courtly intrigue. The combination of poisons with newly evolving weaponry, such as the crossbow, further underscores the continued evolution of toxicology as a strategic science during this period.

Early Modern Era: Blowguns and Exploration

The Early Modern Era, a period between the 15th and 18th centuries, witnessed a surge of exploration and colonial expansion by European powers. As explorers ventured into previously unknown territories, they encountered indigenous tribes whose hunting and warfare practices incorporated a notable use of poison, most prominently in the form of poisoned darts launched from blowguns.

Indigenous tribes in South America, such as the Yanomami and the Tikuna, were known for their expertise in blowgun hunting. Their poison of choice often came from the skin of poison dart frogs, from which they extracted batrachotoxins. These powerful toxins could paralyze or kill the hunted animal, or an enemy,

almost instantaneously. The process of poison preparation was an intricate one, involving careful handling and treatment of the toxic frogs, a testament to the tribes' deep understanding of their environment.

In Central Africa, various tribes also made use of poisoned darts and arrows, with poisons derived from plants, such as *Strophanthus*, or from beetles like *Diamphidia*, whose larvae produce a potent toxin. This practice remained prevalent even in the face of European colonization and technological advancement, demonstrating the effectiveness of these traditional methods.

In Southeast Asia, indigenous tribes like the Dayaks of Borneo and the Hmong people employed blowguns and poison darts in their hunting practices. The poisons they used were often plant-derived, such as *Antiaris toxicaria*, a species of tree in the mulberry and fig family. Its sap contains a cardiac glycoside that can cause heart failure.

These indigenous methods and their efficacy fascinated European explorers and colonizers. These practices also contributed to the body of knowledge concerning toxicology and pharmacology, often leading to significant medical and scientific advancements back in Europe. Yet, they also underscored the conflicts and power dynamics between the colonizers and the colonized, as the latter often turned to these traditional practices in resistance against colonial encroachment.

In summary, the Early Modern Era brought a broader global awareness of the use of poisons in warfare and hunting, as European exploration led to a cross-cultural exchange of knowledge. This period also illustrates the dichotomy of poison as both a tool of survival and a symbol of resistance.

Modern Warfare: From the Trenches to the Jungles

The advent of modern warfare significantly amplified the use of poison, transforming it from a clandestine tool of assassins and individual warriors into a weapon of mass destruction. This shift is most starkly seen in the gruesome chemical warfare of the World Wars and the defoliant operations during the Vietnam War.

The First World War marked the first large-scale use of chemical weapons, profoundly altering the nature of warfare. In 1915, the German Army initiated the first major chemical attack near Ypres, Belgium, releasing chlorine gas that caused severe respiratory distress and death. This was a turning point in the conflict, leading to an escalation in chemical warfare that included the use of phosgene and mustard gas, a vesicant that caused severe skin blisters and damage to the eyes and respiratory system.

The horrors of this chemical warfare led to the 1925 Geneva Protocol, which prohibited the use of chemical and biological weapons in warfare. Despite this, World War II saw further development and deployment of chemical weapons, although on a less extensive scale. The most chilling advancement was the creation of nerve gases such as tabun, sarin, and soman by German scientists, which had lethal effects even in minute amounts. These gases were not used during the conflict but have unfortunately resurfaced in several conflicts since.

The Vietnam War further underscored the role of chemical strategies in modern warfare, though not in the form of gas attacks. Instead, the US military used a defoliant known as Agent Orange to remove forest cover and expose the enemy. This widespread use of herbicidal warfare caused significant environmental damage and led to a myriad of health issues, including cancer and birth defects, affecting both the Vietnamese people and American veterans.

The use of poison in these conflicts highlights its transformation into a weapon of mass destruction, inflicting harm and death on a scale previously unimaginable. Despite international protocols aimed at prohibiting chemical warfare, these weapons have continued to pose a significant threat in modern conflict scenarios. Thus, this era in the history of poison is marked by both technological advancement and an ongoing struggle to regulate and control the destructive potential of these weapons.

The Cold War and The Rise of Covert Operations

The Cold War, marked by an intense political and ideological rivalry between the United States and the Soviet Union from 1947 to 1991, saw the development and deployment of poison in a new context: covert operations. Both superpowers, amidst an atmosphere of heightened secrecy and subterfuge, reportedly used poisons for clandestine assassinations.

In the United States, the Central Intelligence Agency (CIA) developed a covert program called MK-NAOMI in partnership with the Army's Special Operations Division. The objective was to create a stockpile of toxins that could be used for a range of clandestine operations. Among the most infamous of these was the development of a "dart gun" or "nondiscernible microbionoculator," designed to deliver a fast-acting, lethal dose of shellfish toxin or another poison without detection.

In one of the most famous Cold War poison incidents, Bulgarian dissident Georgi Markov was assassinated in London in 1978 by an umbrella that injected a tiny pellet filled with the poison ricin into his leg, a method that earned the incident the moniker "the umbrella murder." While the exact identity of the perpetrators remains a topic of controversy, the sophisticated design and

execution of the assassination suggest the involvement of a state intelligence agency.

On the Soviet side, the KGB was reputed to have developed a series of toxins for covert use under a program named "Foliant." This included the production of Novichoks, a group of nerve agents designed to be more potent and harder to detect than previous iterations. One of these agents was reportedly used in the attempted assassination of Sergei Skripal, a former Russian military officer and double agent for the UK's intelligence services, in Salisbury, England, in 2018.

The Cold War era thus saw a transition of poison use from the battlefield to the world of espionage. The development and deployment of poisons during this period were characterized by high levels of secrecy, technological sophistication, and precision. They were tools of silent warfare, further blurring the lines between war and peace in this tense geopolitical climate.

21st Century: Radioactive and Chemical Assassinations

The 21st century has seen a continuation and evolution of the clandestine uses of poison established in the Cold War, with several high-profile cases demonstrating the ongoing utility of poisons for covert operations. These assassinations, often involving highly unusual or sophisticated substances, have served to stoke international tensions and fears over the covert activities of nations.

One such incident occurred in 2006, when former KGB officer and outspoken critic of the Putin government, Alexander Litvinenko, died in London from acute radiation syndrome. The cause of Litvinenko's illness was traced to polonium-210, a rare and highly radioactive substance. The poison was allegedly ingested by

Litvinenko through a cup of tea during a meeting with two Russian individuals. This case is significant not only due to the high-profile nature of the victim and the use of a radioactive poison, but also because of the clear trail of radioactive contamination left across London, providing a stark illustration of the risks involved in such operations.

Another infamous poisoning in the 21st century was the assassination of Kim Jong-nam, the half-brother of North Korean leader Kim Jong-un, in Malaysia in 2017. In this case, a potent nerve gas known as VX was used. VX is classified as a weapon of mass destruction by the United Nations and is incredibly lethal, with a drop estimated to kill an average adult in minutes. The method of delivery was also unusual; two women, allegedly believing they were participating in a prank for a TV show, smeared the substance on Kim's face at an airport, leading to his rapid death.

The attempted assassination of Sergei Skripal and his daughter Yulia in Salisbury, England, in 2018 represents another significant event. A nerve agent from the Novichok group, developed by the Soviet Union during the Cold War, was used. The poison was applied to the front door handle of Skripal's house, leading to severe poisoning of both Skripal and his daughter. This case rekindled fears of state-sanctioned assassinations, leading to a significant diplomatic fallout between Russia and the West.

These cases underscore the continued role of poison in covert operations in the 21st century. The substances used are increasingly sophisticated and dangerous, reflecting advancements in chemistry, pharmacology, and related fields. Moreover, the cases highlight a recurring pattern of using poison to silence political dissidents or perceived threats, contributing to ongoing debates about international law, human rights, and state sovereignty.

Ethical, Legal, and Geopolitical Considerations

The history of poison usage, particularly for covert assassinations and warfare, raises significant ethical, legal, and geopolitical considerations. Understanding these factors is crucial in navigating the contemporary discourse around chemical and biological warfare, and in promoting efforts toward disarmament and international peace.

From an ethical perspective, the use of poison in warfare and assassination raises serious questions about the value of human life, the rights of individuals, and the lengths to which states and other actors will go to secure their interests. The silent and often agonizing nature of death by poison makes its use a deeply disturbing act, often considered as a breach of human rights.

Legally, the use of poisons and toxins in warfare is governed by international law, primarily the 1925 Geneva Protocol and the 1993 Chemical Weapons Convention (CWC). The Geneva Protocol prohibits the use of asphyxiating, poisonous, or other gases in warfare, while the CWC provides for the prohibition of the development, production, acquisition, stockpiling, retention, transfer, and use of chemical weapons. It also mandates the destruction of existing stockpiles.

These conventions reflect a global consensus on the prohibition of chemical and biological weapons, constituting a vital part of the law of armed conflict. However, enforcement of these conventions is a complex issue, often entwined with geopolitical considerations. Non-compliance or violation of these conventions, as seen in several of the cases mentioned, not only represents a serious breach of international law but also escalates geopolitical tensions and fuels mistrust among nations.

For instance, the poisoning of Alexander Litvinenko and Sergei Skripal led to a major diplomatic fallout between Russia and the

West, with several countries expelling Russian diplomats in retaliation. Similarly, the use of VX nerve gas in the assassination of Kim Jong-nam deepened the international community's concerns about North Korea's chemical weapons capabilities and its disregard for international norms.

In conclusion, the history of poison usage underscores the vital importance of strengthening international legal frameworks, ensuring their enforcement, and promoting transparency and cooperation among nations. Continued vigilance is necessary to monitor the use and proliferation of chemical and biological weapons, to ensure accountability for their misuse, and to work toward a world free of these devastating tools of violence.

Conclusion

Tracing the history of poison use from prehistoric hunting to modern covert operations paints a vivid portrait of humanity's ingenuity and, at times, our capacity for destruction. It demonstrates the evolution of these deadly substances, from naturally-derived toxins to sophisticated chemical and radiological agents. This journey through time offers not just a history of warfare and clandestine activities, but a reflection of our scientific progress and the ethical challenges we face.

While the advent of international law and conventions has largely curtailed the use of poison and chemical weapons in overt warfare, covert operations and assassinations reveal that the allure of these tools persists. The challenge is further compounded by the dual-use nature of many modern scientific advancements. For instance, while radiological substances and certain chemicals have legitimate medical and industrial applications, they can also be misused as tools of harm, as seen in recent high-profile assassination cases.

In this digital age, we also face new threats in the form of biochemical engineering and potentially, even digitally-induced harm. The possibilities of synthetic biology, for instance, could theoretically allow for the creation of new, highly potent toxins, or the modification of existing ones for increased lethality or resistance to treatment. Similarly, there is a growing concern about cyber threats to biochemical facilities that could result in the release of hazardous substances.

Looking forward, the task that lies before us is twofold. On one hand, we must continue to strengthen and enforce international norms and legal frameworks to deter the misuse of poisons and toxins. This includes improving capabilities for the detection, attribution, and prosecution of violations, as well as fostering international cooperation on disarmament issues.

On the other hand, we must engage in robust dialogue about the ethical implications of scientific advancements and develop governance mechanisms to prevent misuse. This is a task not only for scientists and policymakers, but for all of us, as we navigate the complex landscape of modern technology and its implications for society.

In conclusion, while the use of poison has been a constant across ages, our response to it - in terms of law, ethics, and scientific innovation - must continue to evolve. The lessons of history serve as both a reminder of the devastating potential of these substances and a call to action to prevent their misuse in the future.