

Game of Thrones: The dragons and nuclear weapons nexus

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June 2, 2014

On the surface, *Game of Thrones* is merely another cable television series with the requisite battles, backstabbing court intrigue, and scantily clad (or unclad) characters. But it has deeper meanings with a surprising number of lessons about peace and security for real life. Commentators from institutions such as the Fletcher School of Diplomacy, *Foreign Policy*, and the Atlantic.com have written about how this HBO show—based upon George R.R. Martin’s epic fantasy series, *A Song of Fire and Ice*—helps explain international relations in the real world.

One parallel, however, has escaped analysis: dragons as living, fire-breathing metaphors for nuclear weapons. Despite the fantasy setting, the story teaches a great deal about the inherent dangers that come with managing these game-changing agents, their propensity for accidents, the relative benefits they grant their masters, and the strain these weapons impose upon those wielding them.

“Dragons are the nuclear deterrent, and only [Daenerys Targaryen, one of the series’ heroines] has them, which in some ways makes her the most powerful person in the world,” Martin said in 2011. “But is that sufficient? These are the kind of issues I’m trying to explore. The United States right now has the ability to destroy the world with our nuclear arsenal, but that doesn’t mean we can achieve specific geopolitical goals. Power is more subtle than that. You can have the power to destroy, but it doesn’t give you the power to reform, or improve, or build.”

It makes for a bleak outlook. Or, as a character repeatedly warns in the first episode: “Winter is coming.”

(Spoiler alert.)

Dragons 101. Before going further, a dragon primer: In Martin’s creation, dragons are flying creatures that spew fire hot enough to melt steel, concrete, and flesh. Those who tame them can ride their domesticated beasts into battle as nearly invulnerable weapons of war. A dragon will never stop growing “so long as he has food and freedom”—much like nuclear arsenals continually grow in size and lethality, as long as they have inexhaustible budgets.

In the narrative, dragons were extinct before the exiled Daenerys rearms by discovering how to hatch three dragons from ancient eggs, akin to physicists discovering how to unleash the power of the universe’s elemental forces. And much like nuclear weapons, dragons don’t have a

monopoly on violence. Death and suffering occurs on a massive scale whenever conventional wars ravage the land, turning young soldiers into broken men and treating “smallfolk” as collateral damage.

But as military theorist Thomas Schelling wrote in *Arms and Influence*, their inherently fast-paced destruction sets nuclear weapons apart from the customary implements of war. Schelling suggested “this is a difference between nuclear weapons and bayonets. It is not in the number of people they can eventually kill but in the speed with which it can be done...” Similarly, the mass destruction that accompanies dragonfire makes them akin to heavy bombers with nuclear payloads. This is especially true when the objective is to ride your winged beast into battle, like the B-52 pilot riding a nuclear bomb in *Dr. Strangelove*.

Both dragons and nuclear weapons offer their owners a seemingly inexpensive defense. “[S]ome countries may find nuclear weapons a cheaper and safer alternative to running economically ruinous and militarily dangerous conventional arms races,” wrote Kenneth Waltz in *The Spread of Nuclear Weapons*. With just three dragons and fewer than 2,000 combatants, Aegon (the Conqueror) Targaryen had previously brought most of a continent under his rule, with no time or treasure frittered away in rallying men or building fleets and armaments. Nuclear programs likewise appeal to leaders seeking the most bang for their buck—or “stag,” as the series calls currency.

The triad has three heads. Prophecies about the future, made by eminent sages or in mysterious dreams, play a key role in the lives of the series’ characters. Whether a product of divine guidance or cynical con, these predictions drive the characters’ actions and thereby influence subsequent turns of events. Interpreting any given prophecy accurately, however, proves difficult, with facts sometimes errantly dismissed; news of the rebirth of dragons is waved aside, for example. Conversely, false rumors can be wrongly (or conveniently) accepted as absolute truths—much like the Bush administration’s intelligence reports about supposed weapons of mass destruction in Iraq.

On a similar note, in a vision during her exile, the young Daenerys is told the “dragon has three heads,” leading her to reflect on Aegon the Conqueror and his sisters riding a trio of dragons into battle. This brings to mind America’s nuclear triad, with its separate delivery systems based in the air, undersea, and on land. The current budget environment has prompted many experts to consider trimming the triad. Resistance is strong, however, from some nuclear sages who warn that the arsenal must always have three heads, should one be removed by system failure or a decapitating first strike.

Another way to interpret Daenerys’ vision is as the need to pursue allies to share the burden. Just as Daenerys seeks fellow dragon riders to help her win the Iron Throne, US defense planners sought to deter Soviet conventional aggression during the Cold War by working closely with NATO allies. Nuclear-sharing arrangements, alliances, and aid to the British and French nuclear weapon programs helped America assemble a three-headed dragon to face the Soviet bear.

Deterrence with dragons. Possession of a nuclear warhead does not automatically confer effective deterrence. The possessor must also have the means to deliver the weapon to a target, detonate it at the right time and place, communicate intentions to rivals, and protect its arsenal from attack.

After hatching, Daenerys' dragons are feeble and unable to fly great distances or breathe fire at higher yields. During their infant stage, her dragons behave more like tactical nuclear weapons than those suited for a strategic mission; they are only usable in a localized theater such as inside an enclosed space. Until her baby dragons grew stronger, they were vulnerable to steel or theft. Nevertheless, as long as they could survive a first strike, they could deter conflict, much like what Waltz wrote about small nuclear forces. As dragons age, their scales harden to protect against arrows, just as intercontinental ballistic missile silos eventually were hardened against anything but a direct ground burst. These are lessons every young nuclear weapon state must learn.

Nuclear deterrence is often characterized as preventing war between two or more nuclear powers. But stabilizing concepts such as mutually assured destruction don't exist in Martin's world. As the only one with dragons, Daenerys sacks cities and instills terror in her adversaries. Her ancestor, Aegon the Conqueror, was sole possessor of dragons when his invasion targeted a massive stone stronghold; its castle walls melted under intense dragonfire and they now exist under a cursed legacy, like the firestorms that razed Hiroshima and Nagasaki. Those cities largely recovered, but the legacy of radiation illnesses and cancer lingers to this day.

Optimists who welcome nuclear weapons as a stabilizing influence insist that by their very nature, these arms cause rational leaders of stable regimes to maintain strict control over their state's arsenals and moderate their behavior—or risk retaliation. That prompts the question: What happens when nuclear weapons are in the hands of irrational leaders, less than stable countries, or non-state actors? Fortunately for Westeros, its “Mad King” had no dragons at his disposal. “Burn them all,” he snarled while ordering his city be set ablaze rather than surrender—showing how retaliatory threats mean little to someone bent on suicidal violence.

Waltz dismissed these concerns because “in a nuclear world, to act in blatantly offensive ways is madness. Under the circumstances, how many generals would obey the commands of a madman?” One of the series' main characters, Jaime Lannister, relieved his Mad King of command rather than carry out such orders, but it only takes one obsequious general to launch Armageddon.

For the effect of such weaponry is devastating. General Curtis Lemay, former head of the US Strategic Air Command, once said “between sunset tonight and sunrise tomorrow morning, the Soviet Union would likely cease to be a major military power or even a major nation” if he could just unleash his nuclear battery. The Targaryen family motto “Fire and Blood” could easily have graced the banners of House Lemay.

Limits of dragon warfare. Nuclear weapons may help prevent existential threats, but they have limited use in other military operations or foreign policy goals. As the Tywin Lannister character mused, a “dragon hasn't won a war in 300 years. Armies win them all the time.”

Even with his dragon triumvirate, Aegon the Conqueror was unable to force a resistant kingdom to bended knee. Most of *Thrones'* fictional realms offer a “target rich” environment, with sizable populations living in castles and pursuing strategies suitable to set-piece battle on open fields. The kingdom of Dorne, however, consisted of a rocky, mountainous, arid, desert landscape with relatively small cities, dispersed populations, and ample hiding places—making it more resistant to dragon warfare. After protracted war, Aegon cut his losses because his armies were repeatedly ambushed by resistance fighters who kept retreating to the hinterlands before dragons could arrive. Peace was only achieved through diplomacy a century later, and the region preserved a

wider degree of traditions and freedoms than the rest of the Seven Kingdoms where most of the series takes place.

In similar fashion, during the Vietnam War, the US military faced a protracted campaign by guerrillas undeterred by America's nuclear stockpile. A secret 1967 report produced by the JASON Group determined that nuclear weapons would offer no decisive military advantage. Vietnam was "target poor" with diffuse supply lines and dispersed troops. Our involvement there ended when the Paris Peace Accords declared the "United States and all other countries respect the independence, sovereignty, unity, and territorial integrity of Vietnam."

In much the same way, a Daenerys full of bluster and unwavering confidence takes the ancient city of Meereen by force; none dare openly defy its new queen or else risk a dragon's wrath. As she begins to hold court, however, Daenerys finds political quandaries and challenges where dragons offer little help. Several fans compare Daenerys' struggle to feed her people and end a homegrown insurgency to America's experience in Iraq and the Soviet Union's adventures in Afghanistan. In those theaters, nuclear weapons were ill-suited to achieving specific foreign policy goals. Daenerys ends up relying on her army to conduct counterinsurgency operations and diplomacy to reach an uneasy peace with her neighbors.

Command and control. While dragonlords are said to control their beasts with "whip, horns, and sorcery," US nuclear command and control relies on a complex infrastructure of "planning, directing, and controlling nuclear weapon operations of military forces and the activities that support those operations." When Daenerys loses one dragon and imprisons two others, it leads to a state of affairs similar to unilateral disarmament, as she is no longer able to control her weaponry. If her dragons become too wild to listen to their mother, rivals may see her arsenal as degraded to the point where she lacks the capability to target and deliver fire. Dragons do not require precise accuracy to hit targets, but dragonlords are only dragonlords if they keep a firm hold on their command and control systems.

Maintaining such a grip is hard with several characters trying to take control over Daenerys' dragons for their own geostrategic ambitions. Hollywood action movies are rife with plots about disgruntled scientists, terrorists, rogue government elements, or misguided supercomputers trying to start a nuclear war with someone else's bombs.

Nevertheless, dragons are the envy of the world, even if they are difficult items to procure. The slave owners at Astapor had hoped to trade for one of Daenerys' dragons in exchange for their army of super-soldiers. Instead, they found that a "dragon is no slave" and their purchase backfired.

According to Ohio State University Professor John Mueller, nuclear purveyors "are unlikely to trust their precious bombs to groups they cannot fully control." At a minimum, the next time someone wishes to buy a dragon for personal use, they should check to see if it comes equipped with a safety switch or anything that prevents unauthorized use.

One lesson Daenerys should learn is the value of investments in nuclear security. During an extended stay in an ancient trading city, her adversaries bypass Daenerys' minimal security protocols and steal her dragons. Without the aid of anything like a Nuclear Emergency Support Team, she wanders the city for days before bringing them home. She loses control again when her largest dragon escapes.

Daenerys laments how savage her dragons have become when domestic troubles divert her attention from their stewardship. Pop culture writer Alyssa Rosenberg of *The Washington Post* compared these free-roaming dragons to “loose fissile material.” Faced with a similar situation in real life, President Barack Obama initiated a series of Nuclear Security Summits to make a “serious and sustained effort” to secure vulnerable nuclear material around the world. Daenerys should perhaps assemble counselors with a similar agenda.

Proud parents. After a century-long dragonless era, Daenerys proclaims herself a proud “mother of dragons.” Hugh Gusterson, a *Bulletin* columnist and author of *People of the Bomb: Portraits of America’s Nuclear Complex*, was struck by “the absence of metaphors of death and the superabundance of birth metaphors” in the emerging nuclear weapons culture. Secretary of State Henry Stimson informed Winston Churchill of the first nuclear test with the note, “babies satisfactorily born.”

The early bliss of parenthood—for both nuclear bombs and dragons—eventually wore off as the destructive force of these weapons became apparent. When a mourning father tells Daenerys a dragon ate his child, she is horrified and tries to cage her hot-tempered children. Some nuclear scientists intimately involved in the Manhattan Project such as Niels Bohr, Hans Bethe, and others went on to express concern for nuclear dangers and lobby against the use of that which they had created.

Near the end of Martin’s latest book, Daenerys’ vision quest appears to convince her to embrace the Targaryen conquering tradition. Reunited with her wayward dragon, she sets her sights on Westeros. Unlike some of his Manhattan Project colleagues, physicist Edward Teller pursued a more advanced hydrogen bomb also known as “The Super.” When the United States tested this bomb at Bikini Atoll during *Operation Castle Bravo* in 1954, its explosive yield was significantly higher than expected and spread fallout for miles. Many people later suffered radiation sickness or death, including crew members aboard a Japanese fishing boat named the *Fukuryu Maru*—the *Lucky Dragon*.

If you play with fire... Nuclear weapons and dragons are dangerous even in times of peace. Summerhall, a ruined castle once used by the Targaryens as a resort home, was the site of a mysterious tragedy paralleling the nuclear bomb’s early development. Members of the Targaryen family accidentally unleashed a fiery calamity that killed one of their ancestor kings during an experiment to bring dragons back into their world.

Likewise, a US Atomic Energy Commission report states that there were 26 occurrences of accidental radiation exposures in nuclear experiments and six deaths due to criticality accidents from 1943 to 1970. In 1946, Louis Slotin, a scientist involved in the Manhattan Project, suffered a lethal dose of radiation while calculating the critical mass at which a nuclear chain reaction occurs. The name of the technique used in this procedure: Tickling the Dragon’s Tail.

Daenerys’ dragons are quite popular with fans of the books and TV series. If they appreciate the strong anti-war themes embraced by *Game of Thrones*, they may choose to pity her dilemma rather than lust after her offspring. Martin has said his stories try to bear witness to not just the glory of war, but the ugly consequences of violence—on enemies, on innocent bystanders, and, ultimately, on oneself. Given this perspective and the nuclear parallels, her dragons emerge as a more nuanced plot device; rather than simply “cool” (or hot) creatures, they’re complex creatures that may threaten a character or the population as a whole. When the books and shows are finished, it would not be surprising for Daenerys’ dragons to meet a tragic end, like so many beloved characters in the series; the dragons could turn on their masters, Daenerys might

sacrifice them in the name of peace, or the dragons could unleash unintended desolation across Westeros. Nuclear weapons and dragons may help one conquer, but they are not guarantors of peaceful rule and stability.

A nuclear war in our world would first engulf cities in fire and then usher in a generation-long nuclear winter—our real-life swan song of ice and fire.