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The Thunderous Force of Politics in the Science of *Ball Lightning* and Our World

Since the showcase of science's destructive potential in the late 20th century, politics has shifted science's purpose from the development of society and understanding of mysteries of the universe to an instrument to fuel the development of catastrophic weapons. In Liu Cixin's 2004 work, *Ball Lightning*, we follow the obsession of the main character, Chen, in unraveling the mysteries of ball lightning after the traumatic loss of his parents by the mysterious power. After witnessing the undiscriminating force of ball lightning after being harnessed as a military weapon, Chen gave up his life-long chase of ball lightning and instead transferred his experience from it to build a mathematical model for predicting tornadoes. This achievement awarded him the satisfaction of knowing his research was able to save people, alleviating his guilt from his contribution to the weaponization of ball lightning. At the outbreak of war, Chen discovers his research has been converted to be used as a war weapon, ultimately being used against his own country leading to the death of someone he knew. Chen's experiences showcase the dilemma of science's purpose in civilian and military applications. This dilemma is parallel to the
This paper argues that *Ball Lightning* serves as a warning to the uncontrollable danger of weaponizing science through Liu Cixin's use of the narratives' own fantastical science of ball lightning to serve as a parallel to our own erratic and incomprehensible nature of science and the unpredictability of the utility of scientific research as it merges with politics. It will pull into

account the importance of scientists' responsibility to take into account the misuse of their scientific research.

At the dawn of the 20th century, human civilization faced sequential atrocious wars to date: World War I and II. The lethality of these wars was consequential to scientific research concentrated on weaponry – the atomic bombs and chemical weapons such as mustard gas to list a few (Hacking 7). Since then, weapons have only exponentially become more destructive on a larger scale with nations developing weapons of mass destruction or WMDs. This becomes more concerning with the growing tension between nations. With worrying, fragile political relationships, the focus on science has been shifted to "national defense." Suttmeier argues the influence of China's politics and government on the nation's direction of scientific research is profound (5). Liu portrays this in *Ball Lightning* by referencing the Chinese government's sponsorship of the research of ball lightning with the purpose of weaponizing it for the military. Dramatically, or perhaps even foresightedly, mirroring our real-world global dynamics in the latter part of the novel, war breaks out between the United States and China. In this war, dominance over weapons proves significant with the destructiveness of the US's artificial tornadoes and the uselessness of China's ball lightning cannons. The ball lightning cannon proved useless after the weapon failed to work and was left dumped at the bottom of the sea to prevent the US from stealing it (Liu 224). This revelation caused the government to abandon the research into ball lightning. The narrative suggests that once the government notices the unfruitfulness of scientific research in relation to weapons development, it will immediately halt support. Through this, Liu reinforces Suttmeier's claim that China's directive in science is geared toward a political agenda. The government's support is correlated to the benefits they can sow from scientific research in regard to global relations – such in this case, military prowess – and

not particularly for the betterment of human society overall. Liu Cixin alludes to the influence of our real-world international relations and nations' political agendas on the directive of science to weapons development with the relationship between weapons development and government sponsorship in *Ball Lightning*.

In *Ball Lightning*, the lead female protagonist, Yun Lin, has a fixation on weapons development after traumatically losing her mother to an innovative "bees" weapon in the Vietnam War (294). The original inspiration for the weapon was non-lethal bees, with its only purpose being to scare American soldiers. With efforts driven by conflict and weapons development, a Russian woman that Yun Lin grew attached to, was revealed to have the one responsible for transforming the bees to become venomous with the intent to cause death. This occurrence showcased the potential of something fairly harmless to be morphed into a lethal war weapon. What's to say that this wouldn't happen with science, especially now that the world has witnessed its potential for destruction, or in the case of world leaders, political dominance? Liu delves into this question of the possible dangers of science as the military tries to harness its powers as a fatal weapon. He portrayed a consequence of ball lightning when the research team was tasked with eliminating an eco-terrorist group threatening to blow up a nuclear power plant. Within the terrorists was a class of children on a school trip held as hostages. The military makes a decisive choice of utilizing ball lightning, which eliminates both the terrorists and the children (Liu 205). The indiscriminate force of the weapon leaves Chen with a heavy heart. This scene highlights the lack of distinction WMDs have towards humans – there is no good or bad, only death. Liu Cixin expresses that science is unable to be contained, and would only bring danger when tried.

Infamous weapons that can be drawn as parallels to ball lightning in our real world are nuclear weapons, such as the atomic bomb. In fact, the resemblance between the primary component of the two weapons seems very much intentional, with both weapons' science being based on atoms. Developed during the Manhattan Project, this weapon first introduced itself during World War II. Its destructiveness was showcased by the bombings of Hiroshima and Nagasaki. The bombings immediately eliminated thousands of Japanese civilians with many more severely injured. The effects were long-lasting with impacted areas suffering from radiation exposure, even generational with "radiation exposure [leading] to birth defects and other health problems in the children and grandchildren of survivors" (Lackey 92). Its usage catapulted the influence of the United States as much as the other nations feared the use of such weapons against them. There is a parallel between the bombings of Hiroshima and Nagasaki and the usage of ball lightning during the nuclear power plant hijacking. Both occurrences impacted innocent lives lethally – the uninvolved citizens of the cities, and the school children being in the wrong place at the wrong time. Liu is echoing the incriminatory force that the world faced in the 20th century in the modern setting of the novel. By setting the reflection of the nuclear bombings to a more modern time, the feeling of the concern of being at war becomes more heightened. It brings the fear closer to home. By this, Liu is making the readers pay more attention to the implication of science and how politics is morphing it. He is portraying the ultimately creeping danger of, instead of *Ball Lightning* mirroring our world, our world mirroring *Ball Lightning* as politics and science become uncontrollably inseparable.

As concerns for WMDs heighten, cries for national responsibility become more prominent. Dande asserts Liu Cixin's works exemplify Chinese insecurity toward rapid, unmonitored technological advancement (186). Liu channeled this uncertainty in *Ball Lightning*

through Chen's doubts about the lethal use of ball lightning. His anxiety would lead to his departure from the research, and into research in tornadoes. With the use of his previous experience during ball lightning research in mathematical modeling, Chen develops a mathematical model to aid in predicting the formation of tornadoes. Thus, giving warning time for afflicted regions to evacuate on time and avoid fatalities. Unknown to Chen, his work would later be utilized by the US government to build a weapon capable of artificially forming a tornado. This weapon was eventually used against his own country causing a significant blow in their coastal defense and the fatal loss of someone he knew. Liu indicates the potential of the purpose of scientific research, originally innocently beneficial as with Chen's research, being morphed to be destructive, as in the case of Chen's work. It brings in the importance of scientists considering the potential misuse of their scientific research (Miller 39; Coupland and Kobi-Renée). Despite its ethical and moral dilemma, it can be argued that science is fundamental to society's progression.

It's irrefutable, as Chen had originally intended for his own research, scientific research is crucial in developing human society for civilian applications. As Suttmeier argues, China's directive to focus on science and technology is driven by its idea of national development (5). So, its government's intent to utilize science for civilian use shouldn't be overlooked. In fact, there have been numerous occurrences where research on weapons has ultimately contributed to the development and understanding of science and technology in our society, such as improving healthcare and enhancing communication (Miller 14). Nevertheless, it's important to take into account the reverse of this. Much like how research on weapons can contribute to development, research on civilian applications can contribute to weapons development. Ethical considerations have been overlooked for the sake of the rapid pursuit of advancement. Chen "had thought of

[the possibility of forming tornadoes] before, in fact, but didn't believe anyone would do it" (Liu 224). Chen's ignorance of the potential use of the destructive implications of his research despite his knowledge of it caused the death of Jiang Xingchen and a thousand more people (Liu 225). His belated acknowledgment of responsibility came too late, and if thought of measures to prevent the malevolent use beforehand, he could have prevented the lethal consequences. It brings in irony when Chen is able to come up with a countermeasure against the weapon on the spot; a solution that took no more than a few seconds for Chen that was detrimental in preventing the tragedy. By adding this fact, Liu is highlighting the responsibility and consequences scientists would have to face with their scientific research. Using Chen's experience, Liu advocates for the moralistic usage of scientific research and emphasizes the importance of leaders and scientists being ethically responsible for the use of research and the implications of their research.

In *Ball Lightning*, Liu Cixin draws a mirror of the relationship between politics and the science of our world. He does this by showcasing the influence of politics in the directive of scientific research and its consequences on their lack of ethical considerations using the relationship between the government, the characters, and the science of ball lightning. Liu Cixin showcases real-world global dynamics with the outbreak of war between China and the United States. He then alludes to the growing concern about science's partially unveiled destructiveness as nations' political agendas push for its rapid advancement as these relationships push fear and threats of being implicated by WMDs. This concern brings into the picture the relevance of ethical considerations when it comes to the usage of scientific research in an ethical manner. By utilizing Chen's experience, Liu Cixin highlights that scientists should be the ones taking these ethical considerations into account. Despite this, it's important to not overlook the ability of science and technology's potential to contribute to societal advancement, such as in the area of

medical research. Still, Chen's indirect involvement with the death of thousands weights the lethality of WMDs. Liu Cixin also alludes to this with the moral dilemma Chen faces after his contribution to the killing of school children with the use of ball lightning. He warns against the indiscriminate force of science with the indiscriminate killings of school children and the eco-terrorists. Much like our real world, the destruction of the atomic bomb was not exclusive to soldiers but also to civilians. Liu Cixin is warning about the consequences of merging politics with science and the importance of ensuring these weapons and scientific research are ethically used.

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