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TECHNO-POLITICS:
PRESIDENTIAL RHETORIC AND THE AMERICAN TECHNOLOGICAL MYTHOLOGY

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Abstract

The US American political machine has always been concerned with science and technology. This focus strengthened following World War II as the US government substantially increased funding and work force to support basic and applied research as a major means to compete with and defend against other nations. An army of people now exists within the federal government whose job is to maintain our scientific and technological superpower status. Borrowing from the notion of the rhetorical presidency, this paper discusses the rise of the techno-political presidency in American politics. More specifically, the analysis closely analyzes Truman's "Bombing of Hiroshima" speech, examines significant Presidential scientific and technological discourse since, and speculates upon the implications of such a focus for our political future. This case highlights an important, but neglected area of rhetorical study—significant enough to warrant attention as a rhetorical sub-genre.

Keywords: Presidential discourse, Rhetoric of technology, Political mythology, Genre, United States of America

> *"Like all mythology in a politically conscious age, the idea of an electrical utopia can be and is exploited by established institutions . . . . Technology finally serves the very military and industrial policies it was supposed to prevent"* (Cary and Quirk, 1970).

INTRODUCTION

Progress in science and technology has moved rapidly and unabated during the course of human existence. Despite a few noteworthy acts of resistance to major change, the totality of these protests is easily muted by the sounds of cheers and awe. The proof of humanity's excitement over new scientific and technological discoveries, like a child's fascination with magic, is evident in even our most mundane of historical documents, speeches, and scholarly writings. In fact, scientific and technological advancement has been a cornerstone of all modern civilizations, and our interest in it has very early beginnings. It has been such a large part of our democratic life, it is clear that a pro-technological attitude exists that has influenced political policy and the path of technological and scientific discovery in America. The following sections will investigate the scholarly literature on technology, myth, and genre, analyze a sampling of major presidential speeches that address the issue of science and technology, and speculate on the possibility of a pro-technological discourse genre for rhetorical studies.

TECHNOLOGICAL MYTHOLOGY AND THE POLITICAL ESTABLISHMENT

Few would challenge the idea that we are, as sociologist and philosopher Jacques Ellul (1964) has argued, a technological society. Technology seems to rule our existence. Through both accident and conscious effort, we have welcomed and grown comfortable with technology in our lives. Justifying this comfort is a strong, pro-technological mythology whose roots run deep into all facets of our civilization. This mythology keeps us optimistic about the future of science and technology in our lives. Despite technology's flirtations with doom and disaster, the mythology reminds us that technology has made our lives easier and more productive. In addition, this mythology convinces us to ignore the warnings and to instead put our faith entirely in science's ability to solve our world's problems. However, as Weisner and York (1964) argue, "if the great powers continue to look for solutions in the area of science and technology only, the result will be to worsen the situation" (p. 27).

For good or ill, it is no revelation that we have increasingly perceived technology as something sacred. This is the claim of Ellul (1964), who asserted that we can no longer define technology simply as machines or applied science, because it has truly become a legitimate social institution. Humans, according to Ellul, have always been technology dependent and have always considered technological progress as a neutral, natural fact. This is the part of the mythology that, according to some critics, may very well bind us to a life of routine,

passivity, and emptiness (See Frobish, 2002).

This technological mythology is not new, of course. Lewis Mumford (1932), the first major historian of technology, was the first to argue this point. Indeed, Mumford saw three phases of humanity's modern technological development: an eotechnic water-and-wood complex, the paleotechnic coal-and-iron complex, and the neotechnic electricity-and-alloy complex (p. 110). In each of these eras, Mumford and others show how technology was glorified as a new beginning for humanity and its savior (See Carey and Quick, 1970; Marvin, 1988). The mythology that technology makes things better, then, regardless if it is an illusion is commonplace and significant.

As a theoretical springboard toward understanding how this myth plays out in the political arena, we consult James W. Ceaser, Glen Thurow, Jeffery Tulis, and Joseph Bessette's (1981) influential article, "The Rise of the Rhetorical Presidency." In their article, they claim that there has been a powerful shift in presidential leadership. "Prior to this century," they claim, "popular leadership through rhetoric was suspect. Presidents rarely spoke directly to the people, preferring communications between the branches of the government" (Medhurst, 2004). Over course of many decades, however, presidents have increasingly preferred proving leadership through exercises in public discourse. This has led to the perception that words replace action as the gauge of presidential achievement. The authors write that this shift to the rhetorical presidency opposes the founders' view of the political establishment, and is counter to

the way the political system is designed to operate - governing through law-making, not public discourse.

Modern presidential leadership is now consumed with speechmaking. In fact, Esbaugh-Soha (2010) has suggested that presidents use speeches as a mechanism to influence Congress and policymaking indirectly through the pressure of public support. The content of these speeches, he writes, focuses on a diversity of domestic and foreign matters, and is calculated strategy, which is determined by, among other factors, the political and economic environment as well as the president's approval ratings. Add to this the ever-present news cycle and the dissemination of information on a global scale, according to Peak and Esbaugh-Soha (2008), and it is clear that it is imperative for presidents to address the nation through speeches, in turn seeking to influence media coverage of presidential agendas. Of importance to this research is the increased attention given to scientific and technological policy issues within presidential discourse. This also seems to mirror the rise in number of political offices and committees assigned to address national scientific or technological matters. This makes sense considering that our success in science and technology determines, in large part, our economic power and ranking as a first-world nation. It is in the president's best interest to make science and technology a priority both in terms of policy and speechmaking. The most significant cog is the public's interest, which, this paper argues, is sustained through a powerful mythology propagated by the political machinery that technology is good and worthy of our investment.

A political myth, such as the one supposed here, is a combination of ideology and sacred belief, and more powerful than ordinary narratives. Such a myth, according to Bass and Cherwitz (1978), "selectively interprets and constructs a social reality, influencing the perception of events and relationships" (p. 217). Edelman (1971) argues that "a key condition of the domination of cognition by a political myth is the disposition of the anxious mind to take perceptions of present constraints as immutable: to avoid exploration of alternative possibilities" (p. 43). We often passively accept a myth, in other words, because we believe it to be an absolute and immutable truth (Bass and Cherwitz, p. 217). Moreover, a myth justifies itself by presenting a coherent and historically consistent reality, and "offers a selective interpretation of reality by joining normative and cognitive elements" (p. 218).

If we accept Herbert Marcuse's (1964) belief that technology has always been the elite's favored tool of oppression, then we might expect the political establishment to favor technology by perpetuating pro-technological attitudes through mythic discourse. Mueller (1973) claims that this rhetoric, however, must be plausible and validate the interests of the individual (p. 102). In this case, the political system would endorse pro-technology programs such as corporate incentives and research grants to develop new technology, civil and environmental legislation that favor technological solutions to problems, and educational measures that push technology into the classroom. These programs would frame technological progress as always good and begetting of moral, intellectual, and

spiritual progress for humanity. The myth would also maintain that technology can make us happier, wealthier, and more productive. Therefore, it would, as Mueller suggests, "translate its economic needs and social aspirations into a coherent structure" (p. 102).

We argue that such a pro-technological political myth exists in our society. It is a part of a master narrative that continually justifies itself and our interests. Because of the intersection of many phenomena that make us a smaller world (e.g., globalizing economy, advanced transportation, the Internet, and mass media), and our increased reliance on technology as a means of survival and leisure, this mythology is stronger today than ever. It is no wonder why Americans almost unilaterally believe in the importance of research to maintain our nation's strength (Branscomb, 2013).

This myth is present in and exacerbated by presidential addresses that address major scientific and technological issues, and may constitute a discourse genre. Genres, according to Kathleen Hall Jamieson (1973), "are shaped in response to a rhetor's perception of the expectations of the audience and the demands of the situation" (p. 163). Campbell and Jamieson (1976) have elaborated further that "genres are groups of discourses which share substantive, stylistic, and situational characteristics" (p. 20). Genres are certainly significant rhetorical events. Campbell and Jamieson have suggested that they "are central to all types of criticism because they define the unique qualities of any rhetorical act, and because they are the means through

which we come to understand how an act works to achieve its ends" (p. 10). As Bawarshi (2000) has argued, "genres do not simply help us define and organize kinds of texts; they also help us define and organize kinds of social actions, social actions that these texts rhetorically make possible" (p. 335). The remainder of this paper, then, timelines the escalation of techno-politics in American history, closely analyzes one of the most significant speeches in technological politics, Truman's "Bombing of Hiroshima" address, and analyzes a small collection of presidential speeches regarding science and technology to test the parameters and significance of this genre of political discourse.

TECHNO-POLITICS

A pro-technological attitude existed early in American political history. The U.S. Constitution reads, for example, that Congress shall have the power "to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." This is an important and generally overlooked rhetorical statement. It reveals a commitment and obligation on the part of government to ensure scientific and technological progress. The Constitution also protects certain technologies via freedom of the press. Jefferson once remarked that "newspapers were more necessary than government itself, and he equated the technology of print and the protection of the rights of a free press with literacy and liberty" (Carey and Quirk, p. 6). Even our national anthem's "rockets' red glare" and "bombs bursting in air" hints at the role of technology in this early history.

Such rhetoric works to reinforce pro-technological attitudes that have long invaded our social reality.

Indeed, the myth that science and technology are positive variables in the human equation still persists and influences our political culture. As global awareness illuminates other developed countries' basic and applied scientific research—those with the potential to increase economies on a large scale—U.S. government officials are more than ever touting the importance of our own scientific and technological developments. Ben Bernanke (2011), Chairman of the U.S. Federal reserve has even stated, for example, that our government's achievements in research and development, specifically basic scientific research, is a means to sustain the United States' position as a global leader.

We are facing a political present surrounded by issues of science and technology. We have seen, for example, since World War II, the rise in influence of the scientific and technological political office. There are hundreds of such political offices. Within the White House, for example, sits the Office of Science and Technology Policy, created in 1976, which "plays a critical investment role in maintaining American leadership in science and technology" (Office, 1999). The President's Cabinet consists of several such groups including the Department of Agriculture, Department of Energy, Department of Health and Human Services, Department of Housing and Urban Development, and the Department of Transportation—all of which privilege science and technology. Among the many federal agencies and commissions are the

National Aeronautic Space Administration, Consumer Product Safety Commission, Arms Control and Disarmament Agency, Environmental Protection Agency, Federal Communications Commission, National Science Foundation, National Technology Transfer Center, Nuclear Regulatory Commission, President's Council on Sustainable Development, and the United States Chemical Safety and Hazard Investigation Board. Furthermore, at least dating back to President Franklin Delano Roosevelt, according to Sargent and Shea (2012), presidents have sought out scientific experts in academia to advise them on research and development issues.

We could examine groups such as President's Clinton's Information Infrastructure Task Force or we could list the several dozen technology committees within Congress, but the evidence is clear. The typical political arm is preoccupied by science and technology. Indeed, much of the President's office and cabinet, White House offices and agencies, and Congressional committees are assigned to issues not of civic policy, but of science and technology. In fact, more than \$142 billion is estimated for total US government research and development (R&D), an increase of 1.2% since 2012 and \$60 billion since 1978 (Proposal, 2013). In addition to federal dollars spent on research and development, the government also relies on private investments into science and technology research, according to Bernanke (2011), which typically focuses on applied research as opposed to basic research. Today's industrial expenditures can account for more than 70% of total US spending in this area, for a US total of \$470 billion, making us the

biggest spender on scientific and technological research in the world (Smart Planet, 2013).

While the US government has always generously supported spending on R&D, there is also evidence that it has worked to adjust attitudes to gain popular support. In 1973, for example, a federally subsidized group called the Health, Education, and Welfare Task Force (HEW) was developed to study the increasing resistance to automation in the workplace. They reported that "the impact of technology has been acutely felt by the blue-collar workers as measured by absenteeism, turnover rates, wildcat strikes, sabotage, poor quality products, and a reluctance of workers to commit themselves to their work tasks" (Sale, 1995, p. 251). HEW suggested to corporations that, to assuage concerns and future resistance, they should "allow workers more participation in workplace decisions and *should reassure them about the profits possible* from the introduction of new technology" (p. 251; italics added). The assurance of "profits" as aligned with technological progress is a common component of a pro-tech rhetoric designed to promote positive feelings toward technology. But it is only certain types of technology that the government supports. Congressman Sensenbrenner, Chairman of the House Committee on Science, has asserted that "federal R&D should focus on essential programs that are long term, high risk, non-commercial, cutting edge, well managed and have great potential for scientific discovery" (See Branscomb, 2013). "Funding for programs," furthermore, "that do not meet this standard should be eliminated or decreased to enable

new initiatives" (See Branscomb). If done right, according to Cita Furlani (1994), Director of the National Coordination Office for IT R&D, Federal investments in technology "will help shape our long-term ability to succeed as a Nation." Branscomb (2013) argues that this type of discourse is borne from and continually feeds a pro-technological attitude, claiming, "Research policy that creates new understanding of technology as well as new science is [according to the government] a key to realizing that goal and resolving some of the political conflicts over how public dollars should be spent."

Soon after gaining office, the Clinton-Gore administration published both its technology and science policies. These documents illustrate the powerful commitment of modern politics to such research since both call for an expansion of government intervention in science and technology, with the end goal being to secure our technological superiority in the global market. Clinton's science policy, for example, argued three basic points: 1) "U.S. scientists must be among those working at the leading edge in all major fields in order for us to retain and improve our competitive position in the long term," 2) "we can and must do more to identify and coordinate research thrusts aimed at strategic goals" and 3) "we must not limit our future by restricting the range of our inquiry" (The White House, 2013). We saw it in Clinton's agenda to put a computer in every classroom and in Vice-President Gore's (1992) Earth in the Balance, where he suggested linking technology with nature. Even Newt Gingrich's (1995) To Renew America had a chapter entitled "Tending the Gardens of the

Earth: Scientifically Based Environmentalism."

More recently, President Obama's White House technology page (2013) reads that a 21st century digital infrastructure is the key to our nation's "long-term prosperity and competitiveness," which includes "high-speed broadband Internet access, fourth-generation (4G) wireless networks, new health care information technology and a modernized electrical grid." Obama's presidency, like other presidents before him, is strongly concerned with science and technology. In fact, on his first day in office, Obama created the first ever position for a U.S. Chief Technology Officer.

With hundreds of years of similar evidence found within the annals of US history, it is no wonder why Americans almost unilaterally believe science and technology. While Branscomb (2013) characterizes the modern political commitment as the "time-honored U.S. policy that every federal agency should invest in basic scientific research," its modern genesis begins with the invention of the atomic bomb, Truman's decision to drop it, and important also, his speech the day after. This speech plays a significant role as the catalyst for the cultivated technological and scientific focus in today's politics.

TRUMAN'S ANNOUNCEMENT

On July 25, 1945, President Harry Truman wrote in his personal diary that "we have discovered the most terrible bomb in the history of the world. It may be the fire destruction prophesied in the Euphrates Valley Era, after Noah and his fabulous Ark . . . It seems to be the most terrible thing

ever discovered" (See Ferrel, 1980). His tone was overtly critical of atomic power and aware of the possible global implications of the technology. This is *not* the tone of his radio address to the American people, however (Public Papers, 1961). In his public address, Truman emphasizes the goodness of the bomb, its power to cleanse, and its strength to win the war over evil. There is obviously a rhetorical contradiction between the two messages. What follows is a textual reading of his public statement.

Truman started his announcement by stressing the military importance of the Hiroshima bombing and downplaying human loss. "Sixteen hours ago," said Truman in 1945, "an American airplane dropped one bomb on Hiroshima, an important Japanese Army base." Equating an entire Japanese city with a military base dehumanizes the event, downplaying the significance of what just happened. His next few sentences also failed to capture the larger picture - the 70,000-80,000 lives, or 30% of the city's population, that were just annihilated. He continued, "The bomb had more power than 20,000 tons of T.N.T. It had more than two thousand times the blast power of the British 'Grand Slam' which is the largest bomb ever yet used in the history of warfare." The numbers work to amaze and distract. This first paragraph so effectively diminishes the human element that it sets a tone that persists.

Like the opening paragraph of the speech, Truman's later words highlighted the military gains realized through the bomb. Examine how he proposes that the bomb assists, more efficiently, the military agenda:

> We are now prepared to obliterate more rapidly and completely every productive enterprise the Japanese have above ground in any city. We shall destroy their docks, their factories, and their communications. Let there be no mistake; we shall destroy Japan's power to make war.

His choice of words, more, rapidly, and completely, characterizes what we commonly expect from technology. They are employed to highly the positive benefits of our new capabilities. It is a common formula. Truman can now assert that, "what has been done is the greatest achievement of organized science in history." This one statement epitomizes the entire message and sets the stage for his later appeals.

Truman's rhetoric attempted to drive our attention away from tragedy and toward technological achievement. He precisely pictured the awesome achievement of the atomic bomb in his speech, making sure to avoid the type of language he uses in his diary. Note how destruction becomes transformed into something good: "with this bomb we have now added a new and revolutionary increase in destruction to supplement the growing power of our armed forces." "New," "revolutionary," "increase," "supplement, and "growing," are words of progress, words that show forward action. Indeed, Truman remarked that the atomic bomb is the "greatest destructive force in history." "Greatest" and "destructive force" were juxtaposed in such a way to connote what Carey and Quirk (1970) argue is the "Myth of the Powerhouse." The myth of the powerhouse, as seen in Truman's rhetoric, reconciles apparent contradictions, a combination of hope with destruction, goodness with obliteration.

Truman claimed that atomic power holds much promise as a form of energy, and again works to distract a listening public away from the tragic and disastrous implications. This rhetorical move marks a significant part of the mythology of techno-politics. "In their present form," asserted Truman, "these bombs are now in production and even more powerful forms are in development. …We now have two great plants and many lesser works devoted to the production of atomic power."

Winning the war with atomic power is not in question, then. The real issue was how to best utilize this technology after the war. Truman, in answer, claimed that atomic energy "may in the future supplement the power that now comes from coal, oil, and falling water, but at the present it cannot be produced on a basis to compete with them commercially." Truman, of course, did not mean to pause its movement forward. He established the warrant for future atomic research and development: "before that comes [or atomic power as a competitive power source] there must be a long period of intensive research." With this one statement, Truman maintains a political hold on atomic scientific and technological progress, and essentially is in a position to sway popular opinion that the technology is good. Truman thus validated his actions of his Hiroshima decision and secured a future atomic presence by grounding his language in commercial terms.

Nevertheless, Truman had not emptied his rhetorical toolbox. Truman strengthened his persuasive appeals in yet a third tongue, naturalistic language. He transformed technological progress into a near romantic enterprise. Truman declared, "It is an atomic bomb. It is a harnessing of the basic power of the universe. The force from which the sun draws its power has been loosed against those who brought war to the Far East." Additionally, he claimed, "the fact that we can release atomic energy ushers in a new era in man's understanding of nature's forces." The atomic bomb, therefore, has created a completely new civilization for humanity, one that is healthy and positive.

Like the war overseas, Truman characterized technological progress as a fight. Indeed, the international race to discover how the atom could be harnessed became synecdochic for the war. Truman asserted, for example, that

> The greatest marvel is not the size of the enterprise, its secrecy, nor its cost, but the achievement of scientific brains in putting together fields of science into a workable plan. And hardly less marvelous has been the capacity of industry to design, and of labor to operate, the machines and methods to do things never done before so that the brain child of many minds came forth in physical shape and performed as it was supposed to do.

Truman now likened the progress of atomic technology to intellectual progress in general, characterizing the effort as a

by 1942, "we knew that the Germans were working feverishly to find a way to add atomic energy to the other engines of war with which they hoped to enslave the world." Thus, we see the motive: it was a necessary evil. We had no choice, Truman argued, but to enter "the race of discovery against the Germans." The "battle of the laboratories," he told us, "held fateful risks for us as well as the battles of the air, land and sea, and we have now won the battle of the laboratories as we have won the other battles." But technological progress is worth the risk, and, hence, another part of the techno-political mythology is borne.

Still, the question of post-war uses plagued Truman. Again, he tried to answer this concern. He told us that this "greatest scientific gamble in history" was an "advancement of knowledge." Besides, it must continue since
brainchild. How foolish it would be, he seemed to suggest, to abandon the atomic project—our child.

In an expected rhetorical maneuver given previous attempts, Truman made it clear that he supported an atomic future for America and would support funding. Truman avowed, in this last paragraph, the following:

> I shall recommend that the Congress of the United States consider promptly the establishment of an appropriate commission to control the production and use of atomic power within the United States. I shall give further consideration and make further recommendations to the

Congress as to how atomic power can become a powerful and forceful influence towards the maintenance of world peace.

The President equated atomic power with future peace, not just through active use of the weaponry, but even the simple existence of the technology. The simple existence of the bomb would maintain peace. "Maintenance"—a passive construct— signifies an obligatory stance, that we no longer have a choice in the matter if we wish to protect the free world. Truman also claimed that, "under present circumstances," he would not "divulge the technical processes of production or all the military applications." The atomic project, then, becomes a government project, and the technology becomes military property.

The tone throughout the announcement is obviously not the same tone as that in Truman's diary. The attitude within his diary is skeptical, even cynical toward the technology. His attitude transformed, however, when he moved from private correspondence to public address. There is a big difference between saying that the bomb is "the most terrible thing ever discovered," for example, and it is the "greatest achievement of organized science in history." Truman's public demeanor denoted optimism and nationalistic pride, inspired by a seemingly utopian attitude toward a technocratic world. Technology for the Truman Administration is publicly and politically progressive, morally and intellectually good.

Truman's rhetorical work reveals five basic tenets of this pro-techno political myth. First, political discourse must frame technology in terms of economic, intellectual, and moral goodness. Second, the advance of technology makes life better:

efficient and more productive. Third, technological development will allow citizen activation, democratization, and decentralized government. Fourth, any technological move is the best of alternatives—a move that will, of course, requires economic and popular support. Fifth, any setback in the face of technological progress is a worthy and honorable sacrifice, given that the end product of said progress is of larger significance. These five tenets constitute the techno-political myth, which is sustained by presidential discourse ever since.

His rhetoric typifies how presidents have responded generally to science and technology issues since. We should not forget that the bomb was actually designed under Roosevelt's watch, including that of Vannevar Bush, Roosevelt's Scientific Advisor and later overseer of the Manhattan Project. And while there was a need at this time for a political structure that would protect the atomic secrets, it was Truman's decision to drop the bomb in Hiroshima that forced new demands for tight government control, new political offices, new committees, and so forth. The atomic age had begun, and the US political machine had to reign control over it. Philosopher of technology Langdon Winner (1989) expresses this fact well:

> The atom bomb is an inherently political artifact. As long as it exists at all, its lethal properties demand that it be controlled by a centralized, rigidly hierarchical chain of command closed to all influences that might make its workings predictable. The internal social system of the bomb must be authoritarian; there is no other way (p. 34).

Truman's "Bombing of Hiroshima" speech was an agent of influence and became the benchmark of modern techno-political discourse. Truman's speech helped perpetuate the myth of scientific and technology progress in American life, not to mention attempt to justify the human and capital investment in the "race of the laboratory." Truman's speech is not the only example of modern political discourse that exploits the myth of technological progress. In fact, significant speeches across the political spectrum make use of similar arguments as persuasive reasoning for political action. These speeches make up a genre of pro-technological political discourse that can be helpful in our understanding of future speeches that deal with science and technology. The following historical speeches are analyzed through the lens of these five basic tenets to test the existence of a possible genre: Dwight Eisenhower's "Atoms for Peace," John F. Kennedy's "We Choose to Go to the Moon," Ronald Reagan's "Defense and National Security," and George H. Bush's "Stem Cell Decision." In addition, we analyze Barack Obama's inaugural addresses from 2009 and 2013 due to the explicit mention of science and technology.

GENERIC SIMILARITIES IN TECHNO-POLITICAL ORATORY

Four presidential speeches stand out as change-agents of technological public perception and political policy. Eisenhower's speech, "Atoms for Peace," was delivered to the United Nations' General Assembly in New York City on December 8, 1953. It served many purposes, including reassuring Western Europe that the US did not want to use nuclear weapons; started a program that shared nuclear technology information and equipment with allied countries; set up standards, protocols, and regulations for the use of nuclear technology, which effectively limited the spread of nuclear weapons around the world; and comforted a weary US public that we could repurpose nuclear technology for peaceful means. Another important brainchild of Eisenhower's speech was the International Atomic Energy Agency (IAEA), which still plays an extremely significant role in international politics.

John F. Kennedy's address, the second presidential speech analyzed here, was delivered on May 25, 1961, to a special joint session of Congress. In his speech, he promised to send an American safely to the Moon by the end of the decade, despite not having a plan in place and absent the technology needed to make it happen. His ambitious project was an obvious attempt to save face for the United States, which was losing to the Soviet Union in the space race. That Cosmonaut Yuri Gagarin had become the first human in space on April 12, 1961, was an embarrassment to US politically. More than 400,000 workers later and a budget of more than $20 billion, much more of an investment than originally imagined (See Diaz, 2011), the US was successful in achieving Kennedy's promise on July 20, 1969, when Astronaut Neil Armstrong stepped onto the Moon from the Lunar Module.

The third speech, Ronald Reagan's speech on "Defense and National Security," was a nationally televised address on March, 23, 1983. This major Cold War speech proposed as part of his Strategic Defensive Initia 66 (SDI) the development of space-based satellites that could shoot down nuclear ballistic missiles launched by our enemies. This part especially was largely criticized by mainstream media and the scientific community as unfeasible since the technology did not yet exist and such

technology might not even be possible. For this reason, it was also known by a more popular but also satirical name, Star Wars. Defense experts derided the proposal as it essentially called for the replacement of Mutually Assured Destruction (MAD) as the national defense policy, which may have revived the global offensive arms race. The upshot of the speech, however, was research that resulted in the development of much of our anti-ballistic weapon systems today.

The fourth speech was delivered by President George Bush on August 9, 2001, when he announced in a nationally televised speech that he was going to limit federal funding for stem cell research, a fairly new scientific field that had much potential for finding cures and treatments for major medical diseases, such as Parkinson's and Alzheimer's. While he insisted that he would not cancel funding for existing stem cell lines, he would not approve funding for any new lines over the sixty that already existed, despite that an overwhelming majority of the American public supported it. His address also called for a new presidential council on stem cell research, naming as its chair, Leon Kass—a conservative bio-ethicist from the University of Chicago, who was an opponent of stem cell research as well as in vitro fertilization. Bush eventually vetoed two separate bills on stem cell research, and supported legislation that would have made it a crime to conduct private research on stem cells derived from newly donated embryos.

While not specifically focused on science and technology, the final two speeches in this analysis include Obama's 2009 and 2013 inaugural addresses. While inaugural addresses are typically shorter and more generic in tone, Obama explicitly addresses the importance of research and development in science and technology to move the nation forward and improve our chances of remaining a global economic power while providing a better future for our children.

A review of these speeches reveals a pattern of significance. A frequency search of their most commonly used words shows us that these seven speeches have similarities worth investigating (see chart below). All seven speeches repeatedly use the term "new." Five of the speeches frequently use the terms "peace" and "great." Four of the speeches repeat the terms "power" and "hope." Many of these terms are frequently seen even as early as Truman's speech, which is perhaps more noteworthy. Although Obama employed the terms "new," "peace," "great," "power," "hope," and "knowledge," he also used other positive words in reference to science and technology, such as "understanding," "strengthen," "transformation" and "change."

	new	peace	great	power	hope	knowledge
Truman	3		7	13		5
Eisenhower	8	26	16	12		
Kennedy	23	5	12		3	9
Reagan	19	18		11		
Bush	4		12		7	
Obama 2009	3	2	2	1	2	
Obama 2013	2	3	1	2	3	1

Truman's speech in 1945 gave us a hint at five possible generic arguments that might be used by other political leaders when addressing the public on scientific and technological issues. Testing for the existence of these five statements in other major presidential addresses also tests the existence of a genre of pro-technological political discourse. Of the seven speeches analyzed in this study, six are overtly pro-technology, and while Bush's speech was not exactly pro-science or pro-technology, it was a major presidential speech of significant importance to the scientific community, and was not wholly opposed to the science of stem cell research. Bush recognized the great possibilities of such research, but acted to slow the science to allow for a consideration of the ethical consequences. Lastly, while inaugural addresses usually have broad scope, both of

Obama's speeches focus specifically on matters of science and technology, further evidence that science and technology creeps into all types of presidential discourse. All seven of these speeches, then, are valuable as texts to help us understand the generic possibilities of technological rhetoric.

All six speeches briefly described above are reviewed with respect to these five generic arguments (see chart below). It is quickly apparent that defining technology as good (1) but in need of widespread support (4) are employed by all of them, while the claim that technology makes life easier (2) is only found in five speeches. Four speeches claimed that technological development is worth all risk (5). The least common claim, used by two speeches, was that technology fosters a healthy democracy and inspires citizen action (3).

Possible Generic Arguments	Eisenhower	Kennedy	Reagan	Bush	Obama 2009	Obama 2013
(1) Technology can be framed in terms of economic, intellectual, and moral goodness	X	X	X	X	X	X
(2) Technological progress makes life better—efficient and more productive	X	X		X	X	X
(3) Technology encourages citizen activation, democratization, and decentralized government			X			X
(4) Technological progress requires economic and popular support	X	X	X	X	X	X
(5) Technological setbacks are a worthy and honorable sacrifice	X	X	X			X

ARGUMENT ONE: TECHNOLOGY IS GOOD

That technology is always good and good for economic, intellectual, or moral reasons is the common refrain of all four speeches. Technology for Eisenhower can reveal "mankind's never-ending quest for peace and mankind's God-given capacity to build," and move us "out of the dark chamber of horrors into the light, to find a way by which to minds of men, the hopes of men, the souls of men everywhere, can move forward towards peace and happiness and well-being." Even the "fearful trend of atomic military build-up can be reversed, this greatest of destructive forces can be developed into a great boon, for the benefit of all mankind." For Kennedy, technology shows us that "man, in his quest for knowledge and progress, is determined and cannot be deterred" and provides us with an opportunity for "one of the great adventures of all time." Economically, technology, such as that provided by the space effort, "has already created a great number of new company and tens of thousands of new jobs," and generates "new demands in investment and skilled personnel." For Reagan, technology can help us to be "prepared to meet all threats." "Every item in our defense program," he argues, "is intended for one all-important purpose: to keep the peace." Bush argued, much like Kennedy, that science and technology can "improve human life" and "expand the limits of science and knowledge." He asked, if frozen embryos are "going to be destroyed anyway, shouldn't they be used for a greater good, for research that has the potential to save and improve other lives?"

ARGUMENT TWO: TECHNOLOGY MAKES LIFE EASIER

Five of the seven speeches claimed that technology can make our lives easier either by increasing our efficiency or making us more productive. Eisenhower queried, for example, "Who can doubt that" this new technology "would rapidly be transformed into universal, efficient and economic usage?" The new atomic energy, according to him, would apply the technology "to the needs of agriculture, medicine and other peaceful activities," with "a special purpose…to provide abundant electrical energy in the power-starved areas of the world." Kennedy argued that the "growth of our science and education will be enriched by new knowledge of our universe and environment, by new techniques of learning and mapping and observation, by new tools and computers for industry, medicine, the home as well as the school." He continued by claiming, "Technical institutions…will reap the harvest of these gains." Bush argued, "Research using stem cells offers great promise that could help improve the lives of those who suffer from many terrible diseases." In fact, "the United States has a long and proud record of leading the world toward advances in science and medicine that improve human life." Our efforts in science and technology "have the potential for incredible good—to improve lives, to save life, to conquer disease." In Obama's 2009 Inaugural, he pledged to "restore science to its rightful place and wield technology's wonders to raise health care's quality and lower its cost."

ARGUMENT THREE: TECHNOLOGY IS HEALTHY FOR THE DEMOCRACY

Here, Ronald Reagan argued that technology strengthens the democratic state and allows for a stronger, healthier citizenry. Our decision to support policy decisions that increase our technological defense systems, said Reagan, is a "hard but necessary task of preserving peace and freedom" especially in the face of "temptation to ignore our duty and blindly hope for the best while the enemies of freedom grow stronger day by

day." Such technology offers "a new hope for our children of the 21st century," and is an issue that "involves the most basic duty that any president and any people share, the duty to protect and strengthen the peace." Despite the expense, the technology can "prevent the greatest of human tragedies and preserve our free way of life in a sometimes dangerous world," and can "make America strong again after too many years of neglect and mistakes." In 2013, Obama stated the importance of "collective action" among citizens using technology as a tool for a better future. "No single person," he argued, "can train all the math and science teachers we'll need to equip our children for the future, or build the roads and networks and research labs that will bring new jobs and businesses to our shores."

ARGUMENT FOUR: TECHNOLOGY REQUIRES OUR SUPPORT

Scientific discovery and new technological initiatives are not cheap, and major federal projects do not typically happen without popular support. All six speeches appealed to the public to explain and justify the expense and to rally the public's spirit. Eisenhower argued, "Every new avenue of peace, no matter how dimly discernible should be explored." Kennedy said, "to be sure, all this costs us all a good deal of money," but that to "do all this, and do it right, and do it first before the decade is out—then we must be bold." "We must pay what needs to be paid," he added, because "space is there, we're going to climb it, the moon and the planets are there, and new hopes for knowledge and peace are there." Reagan argued, "the budget now before the Congress is necessary, responsible, and deserving of your support" for "I want to offer hope for the future." Reagan expanded the appeal by claiming, "a strong national defense program is necessary because "we maintain our strength in order to deter and

defend against aggression—to preserve freedom and peace." He concluded his speech by arguing that "we're launching an effort which holds the promise of changing the course of human history." Bush claimed in his speech that "federal dollars help attract the best and brightest scientists" and conceded that "rapid progress in this research will come only with federal funds." With an obvious amount of trepidation, he concluded that "we should allow federal funds to be used for research on these existing stem cell lines, where the life-and-death decision has already been made." He also said that he believed "great scientific progress can be made through aggressive federal funding of research on umbilical cord, placenta, adult and animal stem cells, which do not involve the same moral dilemma." In his 2009 Inaugural address, Obama reminded citizens that math and technology are needed to improve the quality of American life, and that "now more than ever, we must do these things together, as one nation and one people."

ARGUMENT FIVE: TECHNOLOGICAL PROGRESS IS WORTH THE RISKS

That technological progress is worth all risk is a dubious supposition since no one knows the future of technological progress and what consequences await humanity. Without oversight, careful consideration, and dialogue, technological and scientific discovery of course has the potential to negatively affect life in a substantial way. Bush warned the public that there were difficult moral and ethical challenges that must be taken into consideration before moving forward with stem cell research. He argued that "the discoveries of modern science create tremendous hope, they also lay vast ethical mine fields." The risks of technological and scientific discovery must be carefully measured and movement

forward must be slow. This is not a claim found in the other three speeches. Instead, in the other speeches, technological progress is said to be worth all risks because it offers the promise of a better life. Eisenhower argued that "against the dark background of the atomic bomb, the United States does not wish merely to present strength, but also the desire and the hope for peace." He also pledged to "finding the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life." Kennedy claimed that "surely the opening vistas of space promise high costs and hardships, as well as high reward." "This country," he said, "was not built by those who waited and rested and wished to look behind them. The country was conquered by those who moved forward— and so will space." Reagan asked and then answered, "isn't it worth every investment necessary to free the world from the threat of nuclear war? We know it is." "There will be risks," he said, "and results take time. But I believe we can do it." As oil reserves continue to decrease and fuel costs rise, Obama told citizens in his 2013 Inaugural "we cannot cede to other nations the technology that will power new jobs and new industries, we must claim its promise."

DISCUSSION
It is easy to be seduced by technology and easy to ignore the implications on our ways of living. Most do not appreciate the discourse that pushes the development of it or the system of resources that creates it. Langdon Winner (2004) has called this phenomenon *technological somnambulism*, or sleepwalking through the technology. It is a common condition of the mind as most people view technologies as simple tools that they can pick up and put down again without consequence. Technology has become such a major part of our worldview that, as Postman (1993) has written, it helps

shape "the ways in which people perceive reality" (p. 21). Any opposing worldview would be quickly rejected since, as Rokeach (1970) has argued, "the more central a belief the more it will resist change" (p. 3), and our belief in technology is very strong.

This research has analyzed some of the political discourse that has influenced our positive perceptions of technology, helping to make certain technological innovations in the United States possible. This study of techno-political discourse helps reveal the rhetoric politicians have employed to perpetuate the mythology that technology is good, makes life better, and worth all risk. It is a mythology that sustains the public's belief in technology and convinces it to support innovation both psychologically and financially.

The world changed following World War II and the invention of the atomic bomb. For the first time, it was now possible to destroy an entire city with a single piece of human-built technology. It is for this reason that the atomic bomb has not been launched upon another city since Hiroshima and Nagasaki sixty-eight years ago. Political establishments are not naive, and no nation yet has dared such an action and risk equal or greater reprisal. But that is as far as the fear takes us. Tens of thousands of these bombs were developed, and most of these still exist, and each one of them threatens the world. Whether for human nature's want of power and control, amazing ignorance, or eternal optimism, bad technologies like the atomic bomb will always exist and flourish. Once a technology is built, it seems no amount of resistance is enough to eliminate it. The key is understanding the rhetorical processes that started it and the rhetorical processes that sustain it. Truman's speech shows us the power of discourse in shaping public perception of atomic technology,

inspiring a public already enamored by the innovation to keep building an arsenal with little thought to consequences.

Truman's speech following his decision and then launch of the atomic bomb on Hiroshima set the standard for future presidential technological rhetoric. Many of his same arguments are found repeated in presidential addresses on technology throughout the later decades. Indeed, almost seven decades following Truman's speech about the benefits of atomic energy and his private concerns about its destruction, Obama still publicly praises science and technology as the country faces nuclear threats from North Korea and Iran. The six additional speeches analyzed by this paper suggest that most of Truman's strategies may be commonplace, forming the principle components of a pro-technological discourse genre. It certainly warrants future testing since understanding how and why new technology is adopted and diffused within society is critical. Humanity and technology have always and will always be intimately linked, and understanding why we privilege technology is a step toward understanding our nature as rhetorical beings.

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