THE MEAN, GREEN, WAR MACHINE: RHETORICAL CONSTRUCTIONS OF BIOMIMETICS IN MILITARY AFFAIRS

by

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(Under the Direction of Roger Stahl)

ABSTRACT

This project is a rhetorical analysis of public discourse about biomimetics in military contexts. It samples from public, government, and technical documents in an attempt to consider the implications of what may be considered a convergence of biomimetic aesthetics upon U.S. military affairs. First, it surveys contemporary literatures regarding the relationship between technology, military affairs, and the rhetorical construct of mimesis. Second, it analyzes a growing body of discourse in which military endeavors are compared to—and often juxtaposed with—natural phenomena. Third, and finally, it considers how biomimetic aesthetics in "warbot" designs frame public conceptions of military ethos.

INDEX WORDS: Biomimesis, Rhetoric, Militarism, Revolution in Military Affairs, Rhetoric of Disaster, Warbots, Surveillance

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B.A., Texas Tech University, 2006

A Thesis Submitted to the Graduate Faculty at the University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF ARTS

ATHENS, GEORGIA

2010

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May 2010

DEDICATION

For Drew
(1983-2008)

We did it, Bud!

ACKNOWLEDGMENTS

If there is one thing I learned from undertaking this project, it is that nothing worth pursuing can be done on your own. After several years—and literally blood, sweat, and tears—what you will find on the ensuing pages is the result of the unwavering support and infinite patience of Dr. Roger Stahl, who may never know how honored I am to call him my advisor and my friend. His wisdom and insightful comments helped me round out this paper, but it was his words of encouragement that pulled me back from the brink countless times—and for that I am eternally grateful. Of course, the same may be said of my committee members, Dr. Panetta and Dr. Lessl, who also demonstrated the patience to overlook my neuroses and oversee this project. They all ought to receive a medal, but sadly all I can offer them is a copy of this project—which I hope they accept.

As I close this chapter of my life, I am reminded of the countless people who gave me ideas, feedback, and even an excuse for the occasional writing break along the way: people like Dr. Eric Jenkins, soon-to-be Dr. Lisa (Slawter) Volkening, Chip Woodruff, and Katie Rush, all of whom I am proud to consider my friends and colleagues. To Dr. Katie Langford, who for some reason saw potential in me years ago, I say "thank you," because this odyssey would not have been possible without you.

Finally, I owe my parents more than I could ever repay them. From their unconditional love and support to their sage—if sometimes unsolicited—advice, they have always provided the blueprint for the kind of person I want to be. Mom and Dad, I love you. And to everyone else who helped me along the way, I say, "We did it!"

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CHAPTER 1

IN VISIBLE WAR: THEORETICAL UNDERPINNINGS OF BIOMIMESIS IN THE MILITARY-VITAL COMPLEX

> "Homo Sapiens is above all Homo Chameleanus."
>
> –Neil Leach (2006, p. 79)

> "To examine the interaction of engineering and biology is natural, indeed inevitable, if we consider engineering for what it truly is: a continuation of biology by other means."
>
> --George Bugliarello (1997)

Introduction: Critiquing the "nature of war"

At present, warfare finds itself at a watershed moment in history. The strategic and tactical trajectories displayed by the U.S. military apparatus during the Twentieth-Century depict a monumental shift in the way warfare affects the public sphere. In the midst of what is considered the latest Revolution in Military Affairs (RMA), society must address new conceptualizations about the nature, the scope, and the aesthetics of what Arquilla and Ronfeldt (1996) describe as "Netwar." Moreover, this new brand of warfare, characterized by a decentralization of the military apparatus and a shift toward immaterial forms of conflict, brings with it several sets of important questions for rhetorical scholars to consider.

For one, recent developments in military technology reflect a trend in which natural phenomena are used as blueprints for weapon designs, intelligence-gathering devices, and even as metaphors for describing day-to-day military operations. While some early military theorists occasionally depicted war as a prosthesis of nature (for instance, Von Clausewitz (trans. 1873) famously described the chaos that occurs in battle as "the *fog* of war"), biomimesis and

biomimetic entities have become essential tropes in understanding contemporary warfare. This trend reflects an underlying element of the new era of network-centric warfare: namely, that the apparatus of destruction *par excellence* has been imbued with a productive—or life creating—quality. In turn, as militarism permeates more elements of civilian life, discourses of biomimesis seem to follow. From camouflage that mimics patterns found in nature to our barometer-like terrorist threat level indicators, biomimesis plays a significant role in shaping our relationships with both war and nature. This project is an attempt to explore these relationships, and in so doing, arrive at a better understanding of how instantiations of biomimetic war aesthetics affect public understandings of subjectivity and intersubjectivity in the age of Netwar.

More specifically, the project will attempt to map out public responses to biomimetic aesthetics in war (while acknowledging the dialogue that occurs between institutions and publics). I should point out, however, that for the purposes of this study I use the term "public responses" rather loosely, and I consider discourse that might otherwise be excluded from more traditional understandings of what constitutes "public sphere" communication. That is, instead of examining a particular "controversy"—which is the typical modus operandi of rhetorical scholarship—I wish to draw from a number of fragmented texts in an attempt to call attention to a body of discourse that is subtly (and not so subtly) ingrained in multiple social spheres. Thus, I consider articles and discussion forums from publications like *Wired Magazine* and *Scientific American* as part of "public discourse," even though their writers and audiences may possess more specialized knowledge about the topic *du jour* than the "average" person. Similarly, I include military and other technical documents in parts of my analysis because I wish to call attention to a phenomenon that appears to exist on several fronts, and in both the "public" and "technical" spheres.

Of course, the diffuse nature of such discourse suggests that presenting whole texts for analysis would be difficult, if not impossible. As McGee (1999) argues, however, "the only way to 'say it all' in our fractured culture is to provide readers/ audiences with dense, truncated fragments that cue *them* to produce a finished discourse in their minds" (p. 76). Instead of deriving its conclusions from complete texts, then, the texts selected for this project will follow McGee's prescription to "reconcile traditional modes of analysis with the so-called post-modern condition by understanding that our first job…is *inventing a text suitable for criticism*" (p. 76).

In other words, the two primary segments of this project are designed to trace out the "discursive formations" of biomimesis in contemporary warfare (Foucault, 1972). The first segment will analyze how metaphors of natural phenomena (such as natural disasters and animal behaviors) are deployed in public discourse about military endeavors. For example, military operations for the 1991 Gulf War were code-named "Desert Storm," and media coverage of the conflict extended this metaphor by portraying the prewar maneuvers and diplomatic breakdowns as "gathering storm clouds," and the subsequent U.S. bombings as "rain" that "lash[ed] the desert" (Kendrick, 1994, p. 64). Of course, when the war ended, it was reported that the "storm had passed,"—and viewers were then asked to consider the rubble left behind as the aleatory damage path of a cyclone or tornado (Kendrick, 1994, p. 64). Even today, one need only consider the 2007 troop "surge," or the more recent labeling of terrorism by the Obama Administration (as "man-caused disasters") to see that metaphors of biomimesis continue to frame discussions about war.[1] By establishing these discursive practices as endemic to a larger

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[1] Importantly, however, I should point out that I use the term "biomimesis" to extend beyond mere comparisons of "nature" and "warfare," which have been prominent tropes throughout history (especially in Romantic literature). Instead, I invoke the term because it suggests a more literal—or converging—relationship between the two.

phenomenon (i.e. the emergence of biomimetic technologies in warfare), this segment of the project will serve as a provocation for further analyzing biomimetic war aesthetics.

Thus, the second segment will examine public responses to developments in biomimetic robot technologies.[2] In particular, scientists have discovered how to "control" insects (such as cockroaches and moths) and rats via remote. Such developments have significant implications for military and surveillance operations, and in many ways, they are indicative of the shrinking gaps between robots and animals, subjects and objects, and nature and war. Moreover, these technologies (like so many others involved in the military-vital complex) appear to have adopted the aesthetics of—and the logic implicit within—the Deleuzian "swarm." In this context, then, the animal-cyborg offers an opportunity to analyze the ideological and ontological underpinnings of "swarming" discourses used in war and surveillance. Finally, by analyzing these discourses (including filmic depictions of the animal-cyborg), this section of the project will attempt to identify points at which "swarming" war aesthetics both engage and sublimate agency in the face of all-encompassing Netwar.

In sum, these texts should offer some useful insights into the two most significant thematic questions driving this project: The first asks, "How do constructions of war as a natural phenomenon position the military appendage in relation to the public [sphere]?" The second asks, "What does the so-called 'biomimetic aesthetic' signify within the greater context of military affairs?" In other words, with the convergence of so many disciplining technologies in warfare, what spaces (if any) are left for the civilian to negotiate within these power relations? To further contextualize these questions, the remainder of this chapter provides a brief review of

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[2] Again, I am not using "public responses" in the Habermasian sense; Rather, I am using the term to refer to a loose conglomeration of texts (and contexts) that might otherwise be excluded from traditional understandings of what constitutes a "public."

the literature informing the selection of the texts to be analyzed and outlines the basic structure of the subsequent chapters. In order to more easily integrate each text's relevance to the ideas discussed herein, the literature review is organized into three parts: a discussion of war and biopower, a brief survey of surveillance theory, and a brief description of relevant theories about mimesis.[3]

A brief review of literature: Netwar, biopower, and the military-vital complex

"I just want you to know that, when we talk about war, we're really talking about peace."

--George W. Bush (2002)

Several developments in military history have created conditions in which biomimesis has been implanted not just on the battlefield, but also in everyday life. In their book, *Multitude*, Antonio Hardt and Michael Negri (2004) trace out the trajectory of these developments in their discussion of Twentieth-Century warfare. The general trajectory, as Hardt and Negri see it, begins with industrialization and progresses toward our present state of "Netwar." In industrial war, sovereign nations considered war to be a state of exception and unrestrained conflict. For example, in World Wars I and II, militaries engaged in "Total" war through various means (namely via targeting civilian populations). As Hardt and Negri claim, however, the atomic age brought with it a shift in military strategy, and thus signaled an age of deterrence. They write:

> "The specular contest of nuclear threat had reached its apotheosis. This may be the moment when war began to vacillate as a fundamental index of the power of the nation-state…War, at least as modernity knew it, which is to say generalized war involving unrestrained, high-intensity conflict and destruction, began to fade away" (p. 38).

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[3] While much of the literature review discusses phenomena occurring at the institutional level, it nevertheless contextualizes the ensuing public responses that will be explored in each chapter of the project.

Shortly after atomic bombs were dropped on Hiroshima and Nagasaki, the United States found itself engaged in a Cold War with the Soviet Union. The age of deterrence, characterized by restraint and stockpiling of weapons, helped transform war from a state of exception into something that more closely resembled a police action. Whether or not this reorientation was a direct result of the atomic age remains unclear (depending on the level of technological determinism one concedes), but on some level it does reflect the beginning of a trend in which the military apparatus had implanted itself in the interstices of everyday life.

Borrowing heavily from Foucault's (1973) notion of "biopower," Hardt and Negri move on to make the claim that warfare has become biopolitical, in that it is used to regulate, discipline, and hence, *produce* life. Thus, they dub the intricate web of communications technologies, surveillance gathering devices, and other machines involved in the everyday policing of both foreign and domestic entities the "military-vital complex." Echoing Foucault's claim that industrialization led to the constant analyzing, monitoring, and disciplining of bodies, the military-vital complex is an amorphous collection of technologies which are simultaneously producers *of* and produced *by* the system in which bodies—and environments—are manipulated by power-knowledge. While the age of deterrence introduced, or at least, highlighted elements of the military-vital complex, it would not be until the end of the Cold War that biopolitical operations would assume a more prominent role in military operations.

Toward an aesthetic of disappearance: The RMA

At the end of the Cold War, Hardt and Negri argue, the United States experienced a "Revolution in Military Affairs" (RMA), which restructured the military apparatus and gave "U.S. military operations a new standard formula, including exploitation of their almost exclusive supremacy in air power…integration of all possible intelligence forces, maximum use

of information technologies, and so forth" (p. 42). During the RMA, the military was restructured to maximize mobility and minimize soldier casualties. As the emphasis of military resources shifted away from the soldier and toward the technologies at their disposal, warfare became increasingly disembodied. Hardt and Negri write:

> "According to the ideology of the RMA, however, war no longer needs masses of soldiers who are massacred in the trenches. The humans on the battlefield, in the air, and at sea have become prostheses of the machines, or, better, internal elements of the complex mechanical and electronic apparatus…*It should come at no surprise, then, that the body and brain of…a soldier are to be preserved*" (p. 42, emphasis added).

This trajectory—toward immateriality and the de-corporation of the soldier's body—has important implications for public conceptions of warfare. Although new machine-bodies are created to replace soldiers' bodies on the evolving battlefield, civilians (and even soldiers) are still grappling with the issues raised by the disappearance of death in scenes of war. As Paul Virilio says of our current condition: "We haven't adjusted yet, we are forgetting our body, we are losing it. This is an accident of the body, a de-corporation. The body is torn and disintegrated" (Wilson, 1994). Indeed, the varied and often visceral reactions given in response to this phenomenon suggest that the public is still adjusting to the substitution of technology for bodies in war. This "body" of discourse, then, is worthy of further consideration.

In the context of this project, advancements in surveillance and information-gathering technologies have, in addition to creating a state of hypervisuality, promoted advancements in stealth technologies—another form of disembodiment. The relationship between vision and disappearance will be discussed further in the surveillance section of the literature review, but it is mentioned here because the drive for invisibility in military affairs was one of the first

manifestations of disembodied warfare.

Furthermore, advancements in robotics and artificial intelligence suggest that humans may be taken "out of the loop" altogether in future conflicts. Yet even if war without humans is not an immediate possibility, movies like *I, Robot*, *Minority Report*, and the *Terminator* series suggest an acute public consciousness of the implications these technologies may have in the future. Such reactions range anywhere from the classic Luddite rejection of any technological advancement to an eager, and perhaps adolescent, anticipation of events such as Kurzweil's (2005) version of the Singularity, when machine intelligence will surpass human intelligence, and in so doing surpass biological evolution itself.

In some respects, however, Hollywood has yet to devote as much attention to developments in biomimetic technology. For example, scientists have found ways to "control" the movements of living organisms such as insects and rats (Harder, 2002). Applications of this technology could affect the ways surveillance is conducted as well as how computer, human, and other animal intelligences are incorporated on the battlefield.

Besides biopower and disembodiment, there is one more element from *Multitude* that speaks to the underpinnings of this project. According to Hardt and Negri, multitudinous war has several self-organizing features that imitate patterns found in nature. In particular, they see future, if not current, military operations as events in which the fractured networks of the military apparatus crystallize in flurries of activity. The process is likened to a swarm of bees reacting to the liminal data supplied through the hive network, a comparison drawn explicitly from Deleuze and Guattari's (1987) exploration of swarming behavior. For Deleuze and Guattari, swarming is the process that most aptly depicts the asymmetrical vicissitudes of an era comprised of fluid subjectivities (and intersubjectivities) and multiplicitous flows of information.

Within this system, conflict is considered to be a fleeting crystallization of activity that endlessly repeats over several (perhaps even thousands of) different points of contact.

Deleuze and Guattari's "swarm" is salient in discourse about Netwar for a few reasons. The first, of course, is that it captures the structural and operational transitions seen in recent military deployments. In fact, military planners and roboticists have made explicit references to swarming in their descriptions of what future military operations will look like. For example, the Sante Fe Institute carried out a study on "Proliferated Autonomous Weapons," or PRAWNs. In this program, basic unmanned systems would use sensors to find targets, an automatic target acquisition algorithm to identify them, and a communications network to relay information about what other robots in the "swarm" are seeing and doing. As the PRAWNs spread around like a flock of birds (or swarm of bees) in an almost random search, they would broadcast to the group any targets they find. Swarms would then form to attack each target, while each individual robot would know if enough other robots were attacking a given target, and thus move on to other targets. Notably, Lockheed Martin is developing a similar program of robot swarms funded by the Defense Advanced Research Projects Agency (DARPA), which has been dubbed the "Wolves of War" program (Gizmag.com, 2003). In fact, these types of systems have already experienced successful applications: One researcher built a basic program for boids, or artificial birds, that worked so well at maintaining the spacing of a flock of robots that it was used in the 1992 movie *Batman Returns* to create realistic-looking bat sequences (Reynolds, 1994). Additionally, a research company by the name of iRobot (named after the 2004 Will Smith movie by the same title) has already run programs with swarms sized up to ten thousand, indicating that the size of military robot swarms in the future could itself prove psychologically debilitating to enemies (Singer, 2009, p. 234).

The second reason the Deleuzian "swarm" is an apt descriptor of discourse about Netwar is that it is itself a biological metaphor for inorganic processes. Ironically, many contemporary depictions of war suggest that advancements in technology have made war into more of an organic phenomenon; a process as inevitable and uncontrollable as the rising tides, the prevailing winds, and the changing of the seasons. For instance, De Landa (1990) compares the effect wars have on societies with "cyclones," "hurricanes," "migrations," and "turbulence"; the operations for the 1991 Gulf War were code named "Desert Storm"; and in 2007 President George W. Bush (along with several other public officials) called for a troop "surge" in Iraq (Duffy, 2008). These examples, among others, indicate the tendency for war during the RMA to be construed not as a human construct, but as part of nature itself. As previously mentioned, the first text in this project will examine how these biological metaphors fit within the context of biomimetic trends in war; yet they are mentioned here to point out the self-organizational quality implicit in such constructions. Like the Deleuzian swarm, these metaphors of self-organizational phenomena appear to eschew human agency, which calls into question whether war can be stopped, or even prevented in the first place. While this question is beyond the scope of this project, it illustrates that these constructions of war affect our ontology—something that does concern this project.

In sum, Hardt and Negri provide a synopsis of the structural, philosophical, and social transformations experienced in Twentieth-Century warfare. From industrial war to the age of deterrence to the RMA to Netwar, the trajectory indicates that war is becoming increasingly immaterial and, as a result, the "reach" of military relations extends into nearly every social sphere; that its functions have become increasingly biopolitical. At the same time, warfare has become increasingly disembodied, especially when considering advancements in the fields of robotics and stealth technology. Finally, new conceptions of network-centric warfare emphasize

swarming techniques and other biological processes, which are then manifested in our discourse about military operations. In the next section of the literature review, I will briefly survey surveillance theory to ground the project's discussion of visuality and aesthetics in the age of Netwar.

Surveillance theory: Panopticism… and beyond

> "It had to be like a faceless gaze that transformed the whole social body into a field of perception: thousands of eyes posted everywhere, mobile attentions ever on the alert, a long, hierarchized network…"
>
> –Michel Foucault (1979, p. 214)

In addition to experiencing increasingly biopolitical military operations, the Twentieth-Century also witnessed the infiltration of the camera into the battlefield—and then into everyday life. Media scholars have argued that the introduction of the camera marked an epistemic shift in Western society, in which orality and literacy was supplanted by vision (Innis, 1991; McLuhan, 1994; Ong, 1982; Postman, 1993). This shift precipitated significant changes on the cultural and communicative landscapes. For one, the dominance of vision allowed imaging technologies to become a convenient and efficient medium for crafting arguments on a large scale. As a result, scholars such as Veblen (1899), who wrote about the conspicuous consumption of the leisure class, and Debord (1977), who wrote about the "society of the spectacle," noted that the visual—the conspicuous and spectacular—had become an instantiation of dominance and power. Relatedly, feminist critics have pointed to what Mulvey (1989) calls the "male gaze" as an implicit construction of cinema in which heterosexual patriarchy is perpetuated. While these studies offer considerably divergent perspectives on seeing itself, they all point to the relationship between vision and power. This section of the literature review is devoted to further explicating this relationship, as it drives much of the discourse about the texts that will be analyzed in Chapter 3.

Using the words of Foucault (1982), the relationship between the spectacular and dominance operates as a site of "power relations," and his theory of panopticism informs much of this project. As Foucault points out (1979), the visible itself is not necessarily situated in a position of power; rather, it finds itself engaged in power relations. "Visibility is a trap," he writes (p. 200). For him, vision serves as a method through which power-knowledge is verified and inscribed on the body. Specifically, Foucault discusses the panopticon as a technology of surveillance in which the surveillors remain hidden while "prisoners" of the system are constantly subject to the disciplining power of the gaze (or at least perceive such a constant scrutiny).

Foucault's ideas about the panopticon inform many elements of this project. For one, the analysis of camouflage will consider how the rise of the surveillance apparatus raises the question of how people are to negotiate the politics of seeing and being seen. The panopticon suggests that this is a site of power relations, for we see in *Discipline and Punish* that if the subject of vision can subvert the surveillant gaze at all, it must do so from *within* the field of vision. In other words, as William Bogard (2001) writes:

> "Technically, the panopticon is always visible (the guard tower's presence is a constant imposition), yet power escapes visibility by escaping its own means of verification; that is, it eludes being seen and recorded by its own tools. It resists being converted into a verifiable event…If he [sic] wishes to subvert panoptic power, the prisoner must adopt a parallel strategy, i.e. to remain visible but unrecorded and unverifiable. And he must take advantage of the same tools and strategies that the system of surveillance uses to verify his presence and status within the system…not so he can become a surveillor, but rather so he can dismantle the surveillor's control of the relation of visibility to verification" (p.

109).

While the panopticon provides a starting point to analyze the power relations implicit in the architectures of everyday life, other developments in technology suggest a need for the reconceptualization of surveillance practices. Considering the trajectory outlined by Hardt and Negri, it may be argued that at roughly the same time the RMA transformed the governing organization of the military into a highly technologized policing network, the organizing structure of surveillance technologies decentralized as well. Indeed, from cameras above traffic lights to "nannycams" to Web browser "cookies," the manifold nature of contemporary surveillance and dataveillance technologies has led some away from Foucault's (perhaps overused) metaphor of the panopticon. Haggerty and Ericson (2000) express their unease with the Foucauldian paradigm:

> "Foucault fails to engage contemporary developments in surveillance technology, focusing instead on transformations to eighteenth and nineteenth century total institutions… Even authors predisposed to embrace many of Foucault's insights believe that rapid technological developments, particularly the rise of computerized databases, require us to rethink the panoptic metaphor" (p. 607).

Adding to their criticism, the two go on to develop what they call the "surveillant assemblage," which foregrounds the convergence of heterogeneous surveillance practices and networked digital technologies. Central to their idea of the assemblage are what they call "flows"—of data and information—which are reassembled into distinct "data doubles" which can be scrutinized and targeted for intervention. Indeed, they say, we "are witnessing a rhizomatic leveling of the hierarchy of surveillance, such that groups which were previously exempt from routine surveillance are now increasingly being monitored" (p. 606). Others have

developed their own theories about post-panopticism (Mathieson, 1997; van der Ploeg, 2006). While their terminologies are distinctly different, each attempts to move from a centralized panoptic model to a more decentralized assemblage or network model; from "Orwell's *1984* and the Foucauldian-Benthamite panopticon, to notions of network and code, and electronic proliferations and flows" (Friesen, Chung, & Feenberg, 2006).

The debate about "post-panopticism" is mentioned here not to suggest that elements of panopticism do not exist in society—indeed, much of this project is devoted to the notion that visuality contributes to the biopolitics of everyday life. Rather, the era of so-called post-panopticism implies many of the same structural and self-organizational elements depicted in the RMA, which suggests a convergence between the military apparatus and the surveillant assemblage. Simultaneously, camouflage and other biomimetic entities seem to operate within this field of power relations: On the one hand, technologies of detection employ biomimetic technology as a means of escaping detection (thus disappearing from vision like the panopticon). On the other hand, however, biomimetic aesthetics have been reappropriated as powerful symbols in the public sphere.

Either way, biomimicry represents a focal point, or discursive formation, in contemporary understandings of warfare. As the structural and organizational developments in war and visuality (surveillance) continue to merge, biomimesis offers a point at which one may engage the rhetorical components of this phenomenon. Of course, biomimesis serves as a material development endemic to the hypervisuality of post-industrial warfare; however, it also functions in the realm of the immaterial (e.g. when natural phenomena are invoked when describing contemporary warfare). Thus, the final section of the literature review will attempt to situate biomimesis as a trope by providing a brief theoretical overview of mimesis itself.

Biomimesis and rhetoric: Two peas in a pod?

> "Nature creates similarities. One need only think of mimicry. The highest capacity for producing similarities, however, is man's."
>
> --Walter Benjamin (1978, p. 333)

From about the time Plato rejected the poets, the trajectory of rhetorical theory and scholarship has been closely tied to its relationship with theories of *mimesis* (Melberg, 1995, p. 10). For instance, opposing Plato's pejorative use of the term as "mere imitation," Aristotle went so far as to identify humans as mimetic animals (Huhn, 2004, p. 15). Since then, countless scholars and theoreticians have written about the concept—and it has come to have as many meanings as the number of people who have written about it.[4] There are, however, three categories of mimetic theory that relate to the project at hand: The first samples from Benjamin and Adorno's conceptions of mimesis; the second discusses Roger Caillois' extension of their ideas in his analysis of mimetic insects; and the third appends the idea of repetition to mimesis by sampling from Deleuze and Guattari's "Becoming-."

Moving beyond the idea that mimesis is a process of mere imitation (in which the mimetic entity necessarily loses something of the original), Walter Benjamin constructs it as a process that allows for identification with the external world (Leach, 2006, p. 19). For Benjamin (1978), mimesis is a linguistic concept in which the similarities found in nature become absorbed and rearticulated in language; in which subject and object become fused for a brief instant. He writes, "The coherence of words or sentences is the bearer through which, like a flash, similarity appears" (p. 335). Moreover, mimetic behavior is a process of both assimilation and adaptation,

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[4] The amount of writing on mimesis suggests that an exegesis of its meanings would overburden the project and obfuscate its intentions. Thus, the ensuing review of the concept is limited in scope, but it nevertheless outlines some underlying thematic elements that will provide a foundation for analyzing the texts considered herein.

and is borne out of a basic human need to identify with the environment. Gebauer and Wulf (1995) use the example of children at play to illustrate how this works:

> "The child, on the one hand, approximates himself completely to the environment, which is comparable to mimcry, and, on the other hand, experiences his power over spaces and objects through the mediation of his magical interaction with them. For spaces and objects 'look back,' without completely subordinating the child. Or, we could say, things gaze at the child, providing him with an experience in which to develop self-consciousness" (p. 278).

At the core of Benjamin's theory of mimesis, then, are the ideas of play and the fluidity of identity as they relate to a subject's understanding of the surrounding environment.[5] Adorno (1984) extends these ideas by constructing mimesis as more of an active, creative endeavor. For him, mimesis is "the non-conceptual affinity of the subjectivity produced with its unposited other" (p. 54). Whereas Benjamin saw mimesis as a passive, conceptual engagement with one's surroundings, Adorno emphasizes the sensuousness of the interaction (Leach, 2006, p. 38-48). In other words, Adorno's conception of mimesis is more closely tied to the body than Benjamin's mimesis (as in the case of camouflage).

Despite these slight differences, the two theories of mimesis may be reconciled to portray a process in which subjectivities overcome alienation from the environment through engagement with objects in the environment. For them, mimesis is not an empty mode of surrender; it amounts to "preserving the self against a certain backdrop" (Leach, 2006, p. 24). Thus, we see the first hints of a mimesis that applies to the ontological negotiations that occur in a state of

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[5] Of course, Benjamin recognizes that people can experience this fluidity of identity with both animate and inanimate objects—an important point in the context of this project, which focuses on interactions with both.

Netwar, whereby subjects interact with biomimetic entities and within an environment dominated by surveillance technologies.

Still, other theories of mimesis build upon Benjamin and Adorno's conceptualizations of the process, and may be helpful to the project's discussion of public reactions to biomimetic technology. For example, Roger Caillois (1984) conducted a study of the behavior of insects that blend in with their environment. He surmised that standing out is a corollary to blending in/ with something, and that at different times, creatures wish either to stand out or blend in with their environment. Unlike Benjamin and Adorno, however, Caillois sees mimesis as a lack model not because subjects fail to blend in with the environment, but rather, because they fail to distinguish themselves from the environment, and therefore fail to establish identity. In effect, Caillois argues that mimesis has the opposite effect of Benjamin and Adorno's mimesis, in that he considers assimilation to one's environment to be an act of surrendering agency. This project will put these two bodies of thought into dialogue by considering the subject-object relationships provoked by advancements in camouflage and biomimetic cyborg technology. In other words, these chapters will consider whether mimesis is constructed as an agency-enhancing or an agency-surrendering process in public discourses about these texts.

Relatedly, theorists like Deleuze and Guattari (1987) discuss concepts that may prove beneficial to conversations about biomimesis in the age of Netwar. For instance, Deleuze and Guattari's description of "Becoming-" suggests another way to consider the mimetic process. They go beyond Benjamin and Adorno by arguing that the process of becoming-animal (or becoming-imperceptible) breaks down the barrier between subjects and objects so that each entity vacillates between subject and object. In their famous commentary about the relationship between a wasp landing on an orchid, they see that "becoming" exceeds mere imitation. They

write:

> "It could be said that the orchid imitates the wasp, reproducing its image in a signifying fashion (mimesis, mimicry, lure, etc.). But this is true only on the level of the strata—a parallelism between two strata such that a plant organization on one imitates an animal organization on the other. At the same time, something else entirely is going on: not imitation at all, but a capture of code, surplus value of code, an increase in valence, a veritable becoming, a becoming-wasp of the orchid and a becoming-orchid of the wasp" (p. 10).

Though Deleuze and Guattari explicitly differentiate the process of "Becoming-" from mimesis, the former may be helpful in recent conceptualizations of the biomimetic human-cyborg-animal relationship. Given the numerous flows of information passing between and through the machine, the human, and the animal-cyborg, "Becoming-" may be a more accurate description of this interaction than the dialectical subject-object models proposed by Benjamin et al. Moreover, "Becoming-" introduces the ideas of multiplicity and repetition, and when fused with the notion of "swarming," it appears to be an apt depiction of recent trends in biomimetic robot technology (e.g. the drives toward miniaturization and self-organization).

And so, it is upon these delineations of war, surveillance, and mimesis that this project is founded. While the review of literature on these topics is not meant to be exhaustive, it hopefully contextualizes the bodies of discourse proposed for analysis. In the ensuing chapter, I will consider metaphors of biomimesis present in public discourse about war. This chapter will use the military doctrine for the U.S. war on Iraq, known as "Shock and Awe" as a foundation for this analysis. The documents recommending this approach to war define Shock and Awe as "actions that create fears, dangers, and destruction that are incomprehensible to the people at

large, specific elements/ sectors of the threat society, or the leadership." Specifically, it states "*nature in the form of tornadoes, hurricanes, earthquakes, floods, uncontrolled fires, famine, and disease* can engender Shock and Awe" (Wade, 1996, p. 110, emphasis added). Since the document was released, the military establishment has made a concerted effort to repeatedly cast war as a type of natural disaster—and politicians and the media seem to have followed suit. In addition to analyzing discursive constructions of war as a natural disaster, this chapter will consider speeches and other communiqués (such as the Quadrennial Defense Review) in which military tactics and technologies are compared to biological phenomena (i.e. "swarming" and other animal behaviors).

The trend to cast war and other military operations as natural phenomena has several implications for public understandings of agency, deliberation, and the possibility for dissent against future conflicts. (That is, if war cannot be avoided, then what is the point of deliberating about/ dissenting against a conflict?) Thus, by exploring the implications of these metaphors, and by delineating these discursive practices as endemic to a larger phenomenon, this chapter will position the rest of the project as an analysis of other phenomena that may have contributed to biological constructions of war.

In Chapter 3, I will examine public reactions to emergent animal-cyborg technologies. For example, several projects funded by DARPA have made explicit attempts to incorporate animal bodies into the battlefield. In one such project, scientists inserted nodes into certain animals' brains and were able to control their movements through electrical stimuli. Interestingly, the animals chosen in these experiments were either insects (e.g. cockroaches, moths, and butterflies) or vermin of some kind (e.g. rats and mice). And yet, the DARPA project is not an isolated incident: In 1994, the U.S. Air Force's Wright Laboratory proposed developing

chemical weapons that would attract "annoying" creatures to an enemy location and provoke them into displaying aggressive behaviors. The chemicals could trigger stinging and biting insects (and rodents) to descend upon the enemy, or they could be used to direct animals' paths for surveillance purposes (Wright Laboratory, 1994). In fact, another DARPA-funded research project has explored how to turn sharks into "stealth spies, perhaps capable of following vessels without being detected" (Roach, 2006).

As military technologies continue to merge with nature—by designing robots to look and move like animals, and by including animals themselves in weapon design—publics must grapple with the implications of a "naturalized" brand of warfare. The first section of this chapter will thus analyze discourse about these military projects (by sampling from news stories, commentary, and quasi-public government documents such as the Quadrennial Defense Review). The chapter will then conclude with a discussion of how the discursive packaging of biomimetic designs affect understandings of agency, design, and the role of the military apparatus in everyday life.

In the fourth and final chapter chapter of this project, I will summarize my analyses in relation to earlier criticism and theory and offer thoughts about the role of biomimesis in future public discourse about war.

CHAPTER 2

MAKE MUD, NOT WAR: HURRICANE KATRINA, WEATHER WARFARE, AND WEAPONIZING THE "RHETORIC OF DISASTER"

> "In any case, the weather forecast is here for the war to continue, at least for a while, hampered a bit by the sandstorm."
> –Bob Franken, CNN News Correspondent (Costello, 2003)

> "If you look at Sun Tzu's *The Art of War* and if you look at the enemy called Katrina, it did us in perfectly."
> --Jimmy Duckworth, U.S. Coast Guard (Brinkley, 2006, p. 210)

> "It's as if the entire Gulf Coast were obliterated by the worst kind of weapon you can imagine."
> --President George W. Bush, on Hurricane Katrina (Baker, 2005)

The U.S. military has a long and storied history with negotiating the weather. Events such as the Battle of the Clouds, in which George Washington's army was defeated due to wet gunpowder, and the atomic bombing of Nagasaki on August 9, 1945 (instead of the cloud-covered city of Kokura) are just two examples of how weather has impacted U.S. and, indeed, global military histories (Miller, 1991, p. 42). And yet, after hundreds of years of advancements in technologies designed to control the battlefield environment, weather conditions have remained a notoriously uncontrollable factor for military planners. In fact, for some military theorists, such as Carl von Clausewitz, weather represents the quintessential "X-factor"—the inevitable phenomenon whose impact may only be responded to rather than prevented altogether. Clausewitz called this component of warfighting the "fog" of war, which refers to the elements inherent in combat situations that lead to confusion and miscommunication within the ranks of an army. Thus, for Clausewitz and many other military theorists, weather (and other natural

phenomena) not only remained immune to the mechanization and regimentation of industrial warfare; it was anathema to developments in military affairs. In broad strokes, then, war was for a long time considered a decidedly human construct; a state of exception rather than a chronic condition (Hardt & Negri, 2004).

Recent trends suggest, however, that the relationship between war and the "natural" is changing. On one level, advancements in technology have made predicting—and in some cases, manipulating—weather conditions much easier, which has somewhat mitigated its status as an "X-factor." Not surprisingly, the military has capitalized on these developments and incorporated them into the very designs of its strategies and tactics (giving a more literal meaning to the term "bio-logical warfare"). On another level, the post-Cold War era has given way to asymmetrical combat operations, which by themselves tend to last for shorter periods of time and materialize more fluidly than the highly-structured combat operations exhibited between two state actors. Thus, it may be less surprising that recent discourse about war and terrorism has adopted biological metaphors—and in many cases described conflict itself in terms of naturally occurring phenomena. The semiotic marriage of nature and military affairs (or at least, the convergence of the two) manifests itself in a variety of contexts, but at the core of each case is a set of complex, and often paradoxical, implications for popular understandings of war in relation to the public sphere. That is, if war (and terrorism) is assigned biomimetic characteristics, both in its material design and in its discursive packaging, then what effects do these constructions of war have on the public sphere, and how do they influence the relationship between a military and the people it is ostensibly meant to protect?

This chapter attempts to answer these questions by exploring several discursive practices that blur the boundaries between war and natural phenomena. For one, there seems to be a trend

in which discourse about terrorism eerily mirrors discourse about natural disasters—and in some cases, the two can hardly be distinguished from one another. Thus, the first portion of the analysis examines the U.S. government's response to Hurricane Katrina in order to underscore the biopolitical component of the contemporary military apparatus and highlight how discourse about terrorism and natural disasters are often juxtaposed with one another. In either case, such discourse performs the functions of what Hikins (1996) calls the "rhetoric of disaster," a rhetorical framework which will be explored herein. Importantly, it should be noted that I use responses to Hurricane Katrina only as a jumping off point to then trace out discourses about the possibilities of the military's "weather modification" programs.[6] From there, I will hope to demonstrate how constructions of "bio-mimetic" warfare shift deliberation about war from the public sphere to the technical sphere—thereby stifling the possibility for dissenting viewpoints about a conflict to emerge.

The gathering clouds: Hurricane Katrina and the suspension of Posse Comitatus

Less than four years after the September 11th terrorist attacks, the United States experienced its worst natural disaster in almost a century (Brinkley, 2006). When Hurricane Katrina made landfall over the city of New Orleans in September of 2005, it unleashed a torrent of rain and wind that crippled the city's infrastructure, killed nearly two thousand people, and left thousands more displaced in its wake.[7] While Katrina made landfall as a category five hurricane, and while it would have caused plenty of destruction on its own, several levee failures

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[6] For a more in-depth analysis of the events surrounding Hurricane Katrina, see (Brinkley, 2007); (Booth & Davisson, 2008); and (Berger & Cochran, 2007).

[7] According to the Louisiana Department of Health (2005), the official death toll was 1,464 people; however, determining an exact figure is difficult given numerous deaths that may or may not have been directly attributable to the hurricane itself.

and a grossly disorganized relief effort compounded the stress placed on the social fabric of the city and its surrounding areas (Brinkley, 2006). In the days following Katrina's landfall, accounts of looting and social upheaval inundated the city's law enforcement apparatus, and for a brief period of time, New Orleans descended into chaos.

The failures of the response to Hurricane Katrina are well documented. For many, the disaster exposed the underbelly of racial and socioeconomic tensions that had been brewing in the region for decades. For others, it served as a painful reminder of how ill-prepared the nation's disaster response mechanism was, even in a post-September 11th world. In this context, two salient viewpoints emerged in the storm's aftermath: (1) that the inadequacies of the response leveled a devastating blow to President Bush's persona as the paternalistic national protector (and would ultimately contribute to the Republican party's overwhelming defeats in the 2006 and 2008 elections), and (2) the infamous miscues by the Federal Emergency Management Authority (FEMA) painfully underscored the need for a more streamlined, better-funded, and more easily-mobilized disaster relief apparatus.

Apparently, President Bush agreed with the latter point. Yet instead of redirecting funds and other resources to strengthen civilian and governmental agencies' capabilities, the administration would grant more authority to military entities in disaster response and emergency policing contingencies. Though then-Secretary of Defense Donald Rumsfeld, along with President Bush and other high-ranking officials had been hesitant to federalize troops in the immediate aftermath of Katrina, it seems they quickly warmed to the idea of using military force to tamp down any future domestic social upheaval.[8] Citing natural disasters as a threat to

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[8] The debate about whether or not to federalize troops during the recovery effort itself became a game of political cat and mouse. On the Wednesday after Katrina made landfall, U.S. Senator David Vitter (R- Louisiana) and Karl Rove suggested to Governor Kathleen Blanco (D-

national security (and largely ignoring the potential for community outreach and involvement as a way to inoculate populations against the disruptions seen in the aftermath of Katrina), the Bush administration would wage its own war against the limitations restricting military involvement in everyday affairs (Klein, 2007, p. 14-15).[9] By signing into law the John Warner National Defense Authorization Act of Fiscal Year 2007 (NDAA), which provided gaping loopholes around restrictions of authority found in Posse Comitatus (literally meaning "rule by the county") and the related Insurrection Act of 1807, the President now had the power to federalize any state's troops and deploy them anywhere domestically. In essence, the administration added disaster recovery and domestic policing to the list of potential duties carried out by the military.[10]

Some saw the passage of the NDAA as Bush moving the nation one step closer to martial law (Intelligence Daily, 2007), while others claimed that it was simply an act of pragmatism aimed at redistributing responsibilities to an entity supposedly less bureaucratic and more capable of rapid response than its civilian counterparts. For instance, when asked by the U.S. Accountability Office how to improve FEMA, Sheriff Jack Stephens of St. Bernard Parish stated, "I would abolish it. I'd blow up FEMA and ask the Coast Guard what it needs" (Ripley, 2005).

Louisiana) that she should assign authority over National Guard units to the President. Under the Posse Comitatus law of 1878, governors had to request troop federalization. Blanco saw Bush's push to federalize troops as a "paper reorganization," part of the White House's spin effort to blame *her* for the post-Katrina mess in Louisiana. Ultimately, she would reject the President's proposal. Notably, however, Bush *did* in fact have the authority to federalize the Louisiana National Guard without the Governor's consent. He could have invoked the Insurrection Act of 1807, which gives the President the right to "suppress insurrections," which was a particularly touchy issue in the Deep South: since World War II, the act had been invoked three times, race relations being intrinsic to each case. In the end though, states' rights would prevail, and Governor Blanco would retain control of the troops (Brinkley, 2006).

[9] See also (Kunreuther, 2009).

[10] The Act would be effectively repealed in the following year under the National Defense Authorization Act of 2008, which restored Posse Comitatus and the Insurrection Acts' provisions back to their original state.

While there are valid arguments to be made within each of these frameworks—after all, the NDAA of 2007 *did* grant unprecedented authority to the President, and FEMA *had* become a symbol of governmental ineptitude (particularly after President Bush's "Heck of a job, Brownie" comment)—each misses a potentially larger lesson to be drawn from the bill.

Namely, the biopolitical function of the military apparatus, which had been one of the cornerstones of the latest Revolution in Military Affairs, had been applied domestically. Michel Foucault (1975) argues biopolitics arrives with the transformation in waging war from the defense of the sovereign to securing the existence of a population. For him, this historical shift means that decisions to fight are made in terms of collective survival, and killing is justified by the necessity of preserving life. Georgio Agamben (1998) has extended this notion through the concept of the administration of life and argues that the defense of life often takes place in a zone of indistinction between violence and the law such that sovereignty can be violated in the name of life.

The difference between the sovereign and the biopolitical can be understood in terms of the contrast between Foucault's notion of "disciplinary society" and Gilles Deleuze's (1995) conception of the "society of control," a distinction that plays an important role in Hardt and Negri's *Empire.* According to Hardt and Negri (2002), in disciplinary society, "social command is constructed through a diffuse network of *dispositifs* or apparatuses that produce and regulate customs, habits, and productive practices" (p. 23). In societies of control, "mechanisms of command become ever more democratic, ever more immanent to the social field, distributed throughout the brains and bodies of the citizens" (p. 23). Put another way, the society of control is "characterized by an intensification and generalization of the normalizing apparatuses of disciplinarity that internally animate our common and daily practices, but in contrast to

discipline, this control extends well outside the structured sites of social institutions through flexible and fluctuating networks" (p. 23). This means that social relations "become suffused with considerations of power, calculation, security and threat" (Reid, April 2004, p. 74), and as a result, "global biopolitics operates as a strategic game in which the principle of war is *assimilated into the very weft and warp of the socio-economic and cultural networks of biopolitical relations*" (Dillon & Reid, 2001, p. 42, emphasis added).

Given the observations of Hardt and Negri, the biopolitical capacity of the military apparatus is not a new phenomenon. For them, war is an inevitable condition of Empire and constant as "an instrument of rule" that shapes "all aspects of social life" (Hardt & Negri, 2004, p. 30-32). Thus, it is not terribly surprising that the Bush administration would make steps toward militarizing future disaster relief efforts in the name of "homeland security." What is interesting about the move, however, is that in many ways it represents the logical conclusion of a tendency for those involved in the "War on Terror" to implicitly conflate armed conflict with natural disasters and other biological processes. That is, in "naturalizing" war discursively through biological metaphors, war—or at least, militarism—is more easily insinuated into everyday life. To further explain this process and its effects within the larger framework of war discourse, I will analyze public depictions of "weather warfare": the notion that weather itself can be weaponized for military use.[11] First, though, I will provide some context for this study by outlining some of the relevant bodies of literature concerning rhetorics of war and natural disasters.

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[11] Though it will be discussed later in the chapter, it should be noted here that this text was selected because it is infused with discourse about Hurricane Katrina, biopolitical military operations, and disaster rhetoric.

A brief review of "disastrous" war rhetoric

"Like viewing the rising winds of a hurricane, the signs of power politics were to be seen as a kind of natural disaster, sweeping up the deserving and the undeserving alike."
--G. Thomas Goodnight (1982, p. 226)

A topic as all encompassing as war is a lightning rod for scholarly and popular writing, and it would be impossible to synthesize everything that has been written about it. There are, however, several applicable trajectories—or orientations—in war discourse that speak to the convergence of biomimetics and military pursuits. One portion of this literature highlights a tendency for enemies to be dehumanized and subsequent military action to be framed as an act of purification. Keen (1986), for instance, analyzes political posters and cartoons to demonstrate that belligerent countries have consistently characterized enemies as, among other things, *insects* and *germs*. By extension, casting the enemy as vermin or a disease (which must be eradicated) lends itself to "clean war" rhetoric—and references to "surgical strikes," "clean-up" or "mop-up operations," and rooting out "cancerous" terrorist "cells" abound, particularly in contemporary discourse about warfare (Baudrillard, 1995; Kellner, 1992; Stahl, 2009; Taylor, 1998; Virilio, 1997). These biological metaphors, found within the larger context of "clean war" rhetoric, point to a medicalization of war discourse. In addition to providing another mechanism for dehumanizing the enemy (whether actual or imagined), medicalized war rhetoric "yields a discourse that further distances war from political justification and a deliberative citizenry," and "instead offer[s] up a drama of siege, victims, and governmental experts" (Stahl, 2009 b, p. 546**).** For example, Stahl (2009 b) argues that the yellow ribbon plays a central role in the "medicalization of war" (p. 546), and that "Support-the-Troops" campaigns are reminiscent of natural disaster relief efforts, which foster "an ethical universe where sympathy for the soldier and deferring to expert authorities are the only options [for the citizen]" (Stahl, 2009 a, p. 30-31).

In addition to medicalizing war, "clean war" rhetoric erases the corporeality of combat by censoring images of death and destruction. Norris (1994) argues that military censorship during the Persian Gulf War was "patently aimed both at concealing and at making the extent of the dead—both U.S. and Iraqi, and particularly the numbers of dead Iraqi soldiers and civilian casualties—unknowable" (p. 285). Such censorship functioned to promote a docile public and squelch dissent. Its effectiveness, in tandem with efforts to portray the conflict as a short, manageable war, led President H.W. Bush to declare to a group of legislators, "By God, we've kicked the Vietnam Syndrome once and for all" (Kurkjian, 1991).[12]

Technofetishism is a related category of discourse about war that depoliticizes the citizen's position in relation to the military apparatus. By foregrounding the military's weapons and related technologies, and by imbuing them with a mythical (if not erotic) quality, coverage of "spectacular war" reinforces the schism between the politics driving a war and the citizen's sense of connection with the events on the battlefield. Within this discourse, U.S. weapons are constructed as "smart" or "intelligent" tools whose accuracy and potency are emphasized to promote the military's moral superiority. Conversely, combatants' and insurgents' weapons are cast as "dumb" or "dirty," and discussions about enemy weapons are implicitly laced with language suggestive of sexual impotence and erectile dysfunction (in which resistance is "limp," or "flagging," and enemy weapons are "inadequate"). This neatly categorizes the conflict as one between civilization and barbarism, a long-existing dichotomy in war rhetoric. As Stahl (2009 a) writes:

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[12] The President was referring to a commonly held belief that the atrocities depicted in media coverage of the Vietnam War led to civil unrest and defiance of official government policy, which promoted withdrawal from Vietnam (and supposedly an American defeat).

> "The civilization/barbarism dichotomy is a time-tested one to be sure. In this manifestation the specific difference is cast not in terms of culture but rather hardware. Weapons not only take center stage but also become the primary symbolic currency through which war negotiates legitimacy, righteousness, and a host of other related values. Such values would normally be the province of deliberation and debate. The repeated inscription of these values onto high-tech weaponry displaces the process of democratic deliberation with the material fact of the weapon in all of its self-justifying glory" (p. 28).

These tropes in discourse about contemporary warfare—the "clean war," "support-the-troops," and "technofetishism"—indicate a tendency for government officials and media coverage to shift deliberation about war from the public sphere to the technical sphere (Goodnight, 1982). Within this framework, science and technology take precedent over the human and political components involved in armed conflict. Questions of whether or not something *can* be done replace ethical considerations in policy debates about whether something *should* or *ought* to be done. In effect, the citizenry is asked to defer to so-called "experts," or those in a position of power, about the necessity and virtue of going to war. This, of course, has a freezing effect on public debate, for if war is exalted to a level supposedly beyond the comprehension of the polity, the implication is that debate about a conflict is futile because one cannot know all the facts involved in a decision to go to war.

There is yet another deleterious effect these bodies of discourse have on the public's position in relation to military endeavors: by relegating debate to the technical sphere and constructing war as a natural phenomenon (or a chronic condition), conflicts are decontextualized and publics are stripped of the capacity to remember the events or conditions

that lead to a given conflict or crisis. One way this is achieved is through the use of "master" or "structural" metaphors that guide conceptualizations about a given topic (Lakoff & Johnson, 1980). For example, Pancake (1993) found that depictions of the Persian Gulf War used the "master metaphor" of "war is a storm," which led the public away from questioning the reasons for the war "because few people consider what causes a storm" (p. 284). Similarly, Klein (2007) argues that "Shock and Awe," which has been a central doctrine in contemporary military affairs, is tantamount to conducting shock therapy on public memory. That is, by foregrounding the shock, or catastrophe, done to a social system, it not only robs publics of the opportunity to consider *who* or *what* was responsible for the shock; it creates an exigency for immediate government action and a mandate for public compliance.

The notion of an exigency, or crisis, created through such discourse dovetails with Paul Virilio's argument that the increasing speed of war—in terms of weapons' speed and "real time" coverage of war—creates an atmosphere in which "dromocracy" supplants democracy. In other words, life is fundamentally changed by speed, and the foundations of democracy—deliberation and public engagement—melt into the background of accelerating technologies that govern everyday experience. Virilio (2002) writes:

> "Today, we no longer have time to reflect, the things that we see have already happened. And it is necessary to react immediately. Is a real-time democracy possible? An authoritarian politics, yes. But what defines democracy is the sharing of power. When there is not time to share, what will be shared? Emotions." (p. 43)

Within this purview, it may be said that the kind of "time" that drives the "War on Terror," for instance, acts in conflict with democratic politics and instead lends itself to authoritarian mechanisms. In advancing this point, Stahl (2008) argues that three tropes of "time" work to

construct an authoritarian politics: the deadline/ the countdown, infinite/ infinitesimal war, and the ticking clock. "Time," as it is portrayed in this context, functions to discipline dissent and "operates under the surface of public discourse as the very grounds for discussion" (p. 75).

Take, for instance, the attacks on the World Trade Center and Pentagon on September 11, 2001. Instead of labeling the attacks according to the spaces in which they occurred (a la "Pearl Harbor"), the common terms used to refer to the events are "9/11" and "September 11th," two references that foreground the time at which the attacks occurred and eschew the spaces/ places that were attacked. In effect, these terms decontextualize the events and promote the erasure of public memory, as illustrated by claims that "9/11 changed everything" and that "we now live in a post-September 11th world"—a claim which otherwise would be dismissed as tautological nonsense. If nothing else, however, these terms point to the capacity for "time" to supplant other considerations in discourse about terrorism.

As previously mentioned, another trope of dromocratic war rhetoric is the "ticking clock," in which a countdown or specific timeline is provided to telegraph the commencement of a major event, such as the beginning of a war. Stahl (2008) identifies the rampant use of countdowns—both in the context of war coverage and for events like the kickoff of a football game—as a mechanism through which an event is interpreted to be inevitable. For example, prior to the 2003 War in Iraq, major news networks used countdowns leading up to the deadline set by the Bush administration for Saddam Hussein's abdication of power; they used countdowns leading up to the commencement of combat operations in Iraq; and they used countdowns preceding scheduled press conferences by administration officials.[13] According to Stahl, such

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[13] Another example that comes to mind is the show "24," starring Kiefer Sutherland as a CIA agent charged with thwarting various terrorist plots. Throughout each episode, which supposedly takes place in real-time, a ticking clock is superimposed on the screen as a constant

uses of countdowns had a debilitating effect on dissent about the war, for if the conflict was already an inevitability (as construed by the ticking clock), then the implication was that dissent, and even deliberation about the impending war were exercises in futility. Concomitantly, natural disaster rhetorics—and particularly discourse about the "next" major event, such as a hurricane, tornado, or earthquake—are ingrained with a similar countdown mechanism in which the event is purported to be 1) inevitable and 2) in the not-so-distant future.

A perfect example of this comes in the show "It Could Happen Tomorrow," one of the Weather Channel's burgeoning programs in which hypothetical cataclysmic disasters are imagined to occur in high population areas of the United States, such as Austin, Dallas, Los Angeles, and New York City (to name just a few). Whether it is a tornado hitting downtown Los Angeles, an earthquake striking New York, a wildfire engulfing Austin, or a category 5 hurricane hitting Boston, the premise of the show takes events that are unlikely to happen in a given area and postulates how such an event would impact the area in question. Recurring narratives about unmitigated disaster, a shell-shocked populace, and an inadequate response mechanism surface in each episode—but much like the wildly speculative ruminations about subsequent terrorist plots that followed the September 11th attacks (in which terrorist "splinter cells" were envisioned to be lurking in every corner of society, devising plots like poisoning water supplies and manufacturing diseases that would only kill Americans), "It Could Happen Tomorrow" positions the catastrophic event as an impending force; something for which the population should be prepared to experience within its lifetime. Bolstering this theme, the show often projects how far in the future such an event will likely occur in the suggested area, and in so doing provides a "weather forecast" for something as hypothetical and contrived as scenarios about terrorists who

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reminder of the urgency of the character's situation.

infiltrate toy manufacturing plants and surreptitiously insert bombs in childrens' toys. Yet in the case of "It Could Happen Tomorrow," the show rarely delves very far into the causes of the disaster in question: There may be a passing reference about global warming, or a footnote about a city's inadequate infrastructure, but the point of the show is not to deliberate about climate change, nor does it make any serious attempt to prepare viewers who would live in the affected area to prepare for dealing with such a scenario. Rather, its underlying message is about the vulnerability of the viewer's everyday life (and, by extension, one's agency) within the larger framework of impending forces of destruction. And then, just for good measure, the viewer is reminded about the nearness of such an event, with the concluding phrase "It Could Happen Tomorrow."

Similarly, rhetorical responses to acts of terrorism often gloss over the causes that lead to an attack, and instead foreground its effects as prima facie justification for a state's ensuing response (whether in the form of air strikes or the suspension of habeas corpus). In his address to the nation on September 11, 2001, for example, President Bush declared the reason for the attacks was that "they [the terrorists] hate us for our freedom," and then quickly moved on to discuss the government's immediate responses and then prepared the country for impending military interventions abroad (Bush, 2001). This decontextualization of terrorist attacks also plays out in popular culture. For example, in the 2006 film *World Trade Center*, starring Nicholas Cage, the events of 9/11 are told through the experiences of first responders at the scene of the twin towers in New York. Oddly enough, very little attention is paid to the cause of or the political motivations behind the calamity—that is, a terrorist attack—and the film focuses instead on the emergency facing the responders. In so doing, the film frames the 9/11 attacks within the genre of disaster movies: the plumes of smoke emanating from the towers could just

as easily have been caused by a meteor shower, but for the purposes of the movie the cause is irrelevant so long as the responders are cast in a heroic light.

The sublimation of the motivations and causes of catastrophic events has echoes of what Hikins (1996) refers to as the "Rhetoric of Disaster." For Hikins, this genre of rhetoric plays an "indispensable role […] in preventing unraveling of the social fabric in the face of disaster" (p. 109) and exists to interpret and reinterpret the traumatic event, while embedding the occurrence of the event within the audiences' individual and collective knowledge and beliefs" (Maresh, 2006, p. 18). This rhetorical genre performs seven functions: consolation, theological, heuristic, prescriptive, didactic, preservative, and adjudicative; However, the details of each function of "Rhetoric of Disaster" are not as important for the purposes of this study as is the general premise that within this genre, therapeutic—rather than deliberative—ends are met. When deployed in the wake of a terrorist attack, the "Rhetoric of Disaster" emphasizes the necessity for immediate response as a way to cleanse the populace of the scar created by the attack. For example, Gring (2008) conducted a rhetorical analysis of sermons following 9/11 and found that rather than following the prophetic tradition (which asks a nation to engage in self-examination and contrition), most sermons were focused on grief counseling and themes emulating a "rhetoric of disaster" (p. 271). As discourses about war, terrorism, and natural disasters converge, each more easily lends itself to the "rhetoric of disaster" framework, which in turn impacts a public's capacity to engage such issues in a deliberative manner.

While these bodies of literature do not represent an exhaustive account of all war discourse, they do call attention to some of the issues related to biomimetics and war: elements of the "clean war," technofetishism, time (dromos), and the genre of disaster rhetoric undergird the thematic elements present in juxtapositions of war and nature. When deployed, such

discourses shift public deliberation from the public to the technical sphere, or at least, they stifle opportunities for a polity to engage with its government about the merits of a given conflict. Operating in concert with the biopolitical functions of the military (noted earlier), these orientations toward war implicate themselves into everyday life and reposition the relationships between a public, its government, and its military. In the next section, I will explore how these discourses surfaced in the aftermath of Hurricane Katrina—a time when the notion of "weather warfare" was clearly in the public consciousness. Using this as a jumping off point, I will consider other instances that reinforce these discourses.

Making landfall: "Weather warfare" and forecasts for terror

> "Everybody talks about the weather, but nobody does anything about it."
> –Mark Twain (Smith, 2006, p. ii)[14]

Long after Hurricane Katrina dissipated, New Orleans and a large portion of the Gulf Coast lay in ruins. The storm had exposed the shoddy infrastructure of the region and demonstrated the vulnerability of a society's social fabric when faced with a cataclysmic disaster. With so much devastation in view, the public clamored for a scapegoat. To a large extent, FEMA and its questionably credentialed leader, Michael Brown, made for convenient targets. Others pointed to the politicization of response efforts and lambasted actors from either side of the political spectrum for the lackluster response efforts, and in some cases, Hurricane Katrina was used as a metaphor for the inadequacies of neoliberal economic ideology (Klein, 2007).

Yet there was another, more curious sentiment that emerged in public discourse after

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[14] Generally, but perhaps mistakenly, this quotation is attributed to Mark Twain. It has never been verified in his writings. The true author remains a debatable subject, though the quotation remains a popular one.

Katrina: Some claimed that the hurricane was caused and/or steered by either a state actor (such as Russia, China, or even the U.S. itself) or a NGO (such as al-Qaida or ExxonMobil) to wreak havoc on the region. While there are many versions of this particular conspiracy theory, its most generic form posits that there have been several advancements in covert military technology that allow for weather modification and the capacity to manipulate meteorological phenomena—and that there were several strange anomalies in the events surrounding Hurricane Katrina which suggest such technologies had a role in shaping the catastrophe.

Were these claims outlandish? Yes. Delusional? In all likelihood. Yet this sentiment, along with a number of other conspiracy theories, circulated throughout the media as people tried to rationalize the destruction before their eyes.[15] Despite the tenuous nature of these claims, I mention them here not to grant them credence, but to point them out as an instance in which the convergence of biological processes in discourse about war entered public consciousness. For, as with most conspiracy theories, these sentiments begin with a kernel of truth.

At least, it appears the U.S. military has pursued such weather modification technologies. In a 1996 document titled "Weather as a Force Multiplier: Owning the Weather in 2025," a panel of Air Force theoreticians argued that weather modification programs could help the military achieve full spectrum dominance, and that if such programs were seriously pursued, it would be within the realm of possibility to expect reliable weather modification techniques by the year 2025 (House et al, 1996). Much of the document considers hypothetical scenarios in which weather modification techniques could be advantageous for the military; however, it does not

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[15] One of the more popular conspiracy theories regarding Hurricane Katrina was that the failed levees in New Orleans had been intentionally blown-up by a government actor in an attempt to either "cleanse" the city of black people or create more reconstruction opportunities for local contractors/ real estate developers. Among those propagating this sentiment were Louis Farrakhan and Spike Lee, who were recalcitrant about their position (Grant, 2005).

reflect the official position of the Air Force, as is often misconstrued by those who cite it as evidence such programs are already in place.

Interestingly though, the issue of weather modification had been discussed by government officials well before the 1996 study was released. At the 1976 Environmental Modification Convention (ENMOD) in Geneva, Switzerland, members of the United Nations outlawed state parties from engaging in "military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party" (U.N. General Assembly, 1976). Curiously, the resolution admitted that no such technologies were available at the time, which meant weather modification *per se* was a non-issue for the signatories. As Zalinskas (2000) argues, however, the resolution was to some extent grounded in reality because "two trends, *one military* and *one civilian, were converging*" (p. 236, emphasis added). The first trend had its origin in large-scale use of defoliation chemicals by the United States in Vietnam for military purposes, which "had caused measurable damage to the environment" (p. 236).[16] The second apparent trend was an "increasing civilian research effort being devoted to deliberately alter the environment for some perceived benefit such as to produce rain in regions suffering from drought, abort potentially destructive hurricanes and tornadoes, suppress hail, and divert north-flowing Siberian rivers from their normal course to bring waters to virgin agricultural lands in

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[16] It should also be noted that, during Vietnam, the U.S. implemented cloud seeding operations over the Ho Chi Minh Trail to "reduce trafficability" and prevent the Viet Cong from using the trail to move men and materiel to South Vietnam. Under the guises of "Operation POPEYE" and "Operation Intermediary-Compatriot," the military flew more than 2,600 cloud-seeing sorties and expended more than 47,000 silver-iodide flares over a period of five years at an annual cost of $3.6 million. The results of the project were minimal: it was estimated that the operations may have increased local rainfall by as much as 10%, though this measurement was admitted to be "unverifiable." For a detailed description of the cloud-seeding operations, see Fleming (2007).

south Russia" (p. 236). If these trends were to merge, new possibilities for unconventional warfare might be created—such as those found in the 1996 study by the Air Force—which thus provided the impetus for ENMOD.[17]

While there is no clear evidence that these trends merged in the manner envisioned by those who wrote ENMOD, it appears the two continue to closely parallel each other (at least in terms of how they are discussed in the public). On the one hand, weather modification is discussed as a possible means through which terrorists could attack the United States. For example, in his 1997 keynote address to the Conference on Terrorism, Weapons of Mass Destruction, and U.S. Strategy at the University of Georgia, then Secretary of State William S. Cohen spoke of the potential threat posed by weather modification:

> "There are some reports, for example, that some countries have been trying to construct something like an Ebola virus, and that would be a very dangerous phenomenon, to say the least. Alvin Toffler has written about this in terms of some scientists in their laboratories trying to devise certain types of pathogens that would be ethnic specific so that they could just eliminate certain ethnic groups and races; and others are designing some sort of engineering, some sort of insects that can destroy specific crops. Others are engaging even in an eco-type of terrorism whereby they can alter the climate, set off earthquakes, volcanoes remotely through the use of electromagnetic waves. So there are plenty of ingenious minds out there that are at work finding ways in which they can

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[17] According to Zalinskas, no combatant appears to have violated the treaty—that is, until the 1990 Gulf War, when Iraq's occupation army ignited roughly 150 Kuwaiti oil wells, sabotaged petroleum and natural gas processing facilities, opened oil pipelines, and discharged stored petroleum onto land and into the Persian Gulf. The acts were clearly in violation of the treaty, as they damaged the atmospheric, marine, and terrestrial environments. As he notes, however, no government or international legal authority publicly indicted Iraq for having transgressed ENMOD.

wreak terror upon other nations. It's real, and that's the reason why we have to intensify our efforts."

By speaking of terrorists' potential capacity for weather modification, Cohen implicitly justifies advancing U.S. research on weather modification (along with programs designed to thwart the other threats he mentioned) on the grounds that it advances the interests of national security. In any case, biological threats posed by terrorists—be they viruses, pests, or inclement weather—seem to be a primary point of concern for the official government position at the time. Weather, then, is seen as one of the biopolitical forces against which "society must be defended," to borrow a phrase from Foucault.

Echoing the idea that advancements in weather modification technology may ultimately protect the U.S. from destructive forces, others promote such research on the grounds that it could mitigate—and potentially eradicate—major weather events such as hurricanes. On July 28, 2009, the U.S. Senate Committee on Commerce, Science, and Transportation held a hearing titled "Weathering the Storm: The Need for a National Hurricane Initiative," in which the status of weather modification research was considered. Two important themes emerged from the discussion between the senators and the scientists who testified. The first was that weather modification science had advanced to the point where it could potentially affect hurricanes, and as such, it could serve an important function in promoting national security. At one point, Dr. Kelvin Droegemeier, a Co-Chairperson for the Task Force on Hurricane Science and Engineering National Science Board bluntly stated, "We know through our simulations… that in fact there is no question that you can change the course of a hurricane—that you can kill it off—you can kill off a thunderstorm before it produces a tornado" (SR-253 Webcast). The underlying assumption, of course, was that if it could be done, then it *should* be done in the interest of

national security. After all, the U.S. was fighting a war in which the enemy could very well manifest itself in the form of "Mother Nature."

Consideration of issues related to weather modification has also extended beyond military and government agencies. In the 1998 movie *The Avengers*, British secret agent John Steed teams up with scientist Emma Peel to thwart Sir August De Wynter's plot of world destruction via weather modification. While the movie is modeled after a popular British television series by the same title, its connection to American discourse about weather warfare is thinly veiled. De Wynter, the movie's antagonist, devises a weather altering machine—much like HAARP—to achieve rapid and total dominance over the world's governments.[18] Of course, the capabilities of De Wynter's machine are exaggerated for dramatic purposes, and the science behind the device is largely undiscussed, but at its core the plot reflects a prototypical Western fear of unharnessed technology falling into the hands of a "foreign," nongovernmental actor. In this case, the protagonists are English, while De Wynter is a Scotsman—a distinction which serves to promote the ideas that 1) terrorists are foreign enemies, not domestic ones and 2) that the "real" danger is not the weather modification technology itself; it is a foreign terrorist entity getting its hands on any kind of technology whatsoever (because after all, terrorists are supposed to fight with "dumb" and "dirty" weaponry).

Though *The Avengers* was a particularly campy rendition of what weather warfare might look like, more recent depictions cast such technology within the realm of possibility. In July of

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[18] HAARP stands for the High-frequency Active Auroral Research Program, which is based in Alaska. Ostensibly, the scientific program is "aimed at studying the properties and behavior of the ionosphere, with particular emphasis on being able to understand and use it to enhance communications and surveillance systems for both civilian and defense purposes" (HAARP, 2007), but its covert operations have led some to believe it is a device used to alter the weather—either by steering the jet stream, or emitting waves that trigger earthquakes (That's Impossible, 2009).

2009, NBC aired a miniseries titled "The Storm," in which the unintended consequences of weather modification technology trigger disastrous weather patterns that could wipe out all of human civilization. Although the show has echoes of the "disaster movie" genre—including an overwrought plot, mediocre acting, and a special effects bonanza—it moves on to address the relationships between the military, the media, and the public and the full spectrum encroachment of militarism on everyday life. Rather than creating an archetypal megalomaniac bent on worldwide destruction, the show begins with a protagonist, Dr. Jonathan Kirk, who develops weather modification technology to prevent natural disasters and reduce the effects of global warming. In this case, the science behind the technology is considered in greater detail, and it explicitly discusses heating the ionosphere through a process similar to the one outlined in HAARP. In fact, in one scene, Dr. Kirk uses the project, referred to as "Project Rainbow," to steer a hurricane away from the African coast. Unbeknownst to Kirk, however, the military had been closely monitoring—and funding—the project, and quickly moved to weaponize the technology after its first successful testing. Against his protests, another experiment is run—this time for military ends—but this time a glitch occurs and sets off a chain of events that disrupts the world's weather patterns. With cataclysmic weather events occurring around the world, Dr. Kirk is faced with the challenge of reversing the effects of Project Rainbow—on top of combating corruption throughout the ranks of the military, the media, and the government, all of whom have an interest in covering up the story.

In addition to actually addressing the science behind weather modification, "The Storm" differs from *The Avengers* in that it outlines the useful applications of weather technology, such as drought prevention and reducing the impact of global warming. Also, unlike *The Avengers*, "The Storm" politicizes the effects of the weather modification device. In a general sense, it is

cast as a Frankenstein-like invention that eludes the control of its creators, but more specifically, it is a thinly veiled allegory about the unintended climactic effects of industrialization (or, more accurately, the advancement of technology) and the military's growing interest in biopolitical operations.

Interestingly, within a few days of the NBC miniseries, the History Channel also aired an hour-long show about the possibilities of weather warfare. As part of its "That's Impossible!" series—a program devoted to exploring cutting edge advancements in military technology—the episode maps out the chronology of the military's interest in weather modification technology. Unlike the narratives in *The Avengers* and "The Storm," the episode focuses primarily on determining whether or not weather modification is possible. Several scientists are interviewed, along with a handful of conspiracy theorists and weather enthusiasts. And, much like this chapter, the show uses Hurricane Katrina as a jumping off point to talk about topics related to weather warfare. It then concludes that even though many of the technologies discussed remain largely within the realm of science fiction, the military has clearly taken an interest in weather modification as a means to full-spectrum dominance in future warfare.

While depictions about the possibility of weather warfare remain varied, the underlying message in each case is that war—and by extension terrorism—is to be viewed through the same lens we use to observe and report the weather. To a large extent, then, other aspects of war and terrorism become tinged with similar anti-deliberative discourse associated with rhetorics of disaster. To provide an example of how this happens within the framework of "war as disaster," I will explore how the notion of war "prevention" gives way to the more dromocratic notion of "situational awareness" as a means of identifying conflicts in real-time.

Forecasting disaster: "Situational Awareness" and the terrorist threat level

"It takes a network to fight a network." –Aaron Mannes (Walsh, 2008)

As discourses about weather modification and terrorist events converge on each other, the notion of "situational awareness" becomes the primary conceptualization for preventing future cataclysmic disaster. Endsley (2000) defines situational awareness as "the (1) perception [noticing] of the elements in the environment within a volume of time and space, the (2) comprehension of their meaning, and the (3) projection of their status in the near future" (p. 5), but in military contexts it more generally refers to a force's understanding of the environmental and situational elements that could influence its strategic and tactical operations. Borne out of Clausewitzian models of warfare, situational awareness is exalted as the most effective means through which military planners can overcome the "fog" of war. Such reasoning helped pave the way for an explosion of information gathering technologies and techniques at the beginning of the era of industrialized war.[19]

Though elements of situational awareness appeared in military theory dating as far back as Sun Tzu's *The Art of War*, and despite its growth in popularity during World Wars I and II, the concept would implant itself in the everyday vernacular of military theorists at roughly the same time the latest Revolution in Military Affairs refocused the trajectory of military endeavors around immaterial conflict and Netwar. Following the Cold War era, in which spying and other information gathering techniques were solidified as focal points in military operations, the era of Netwar ushered in a smorgasbord of technologies devoted to obtaining superior situational awareness, both on the home front and on the battlefield. From Global Positioning Satellite

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[19] For example, the introduction of cameras on the battlefield (along with aerial photos) helped military planners monitor troop movements, identify targets, and anticipate the enemy's next move, thus reducing the potential for losing the initiative in a given battle.

(GPS) systems to the Arpanet (which would later become the internet) to unmanned drones equipped with a wide range of sensors and monitoring devices, the U.S. military invested heavily in perfecting its capacity to obtain full situational awareness in the face of asymmetrical warfare. If its enemies relied on deception and hiding amongst civilian populations and unforgiving terrain, then the primary task of network-centric warfare would be to provide superior information and communication to U.S. forces in order to curtail any advantage afforded to enemies by achieving the "element of surprise."

Over time, the conglomeration of technologies devoted to situational awareness would become increasingly seamless. GPS systems became integrated with thermal sensors, satellite imagery, and communication networks to the point where the lag between intelligence gathering and intelligence analysis began to evaporate. Today, real-time satellite images along with GPS coordinates of targets of interest (TOIs) can be patched in to Predator drones, which can calculate wind speed and direction to maneuver itself to intercept the TOI as quickly as possible; 3-D topographical maps can be patched in to troops on the ground, who can then communicate with drones' pilots in real time to determine where air support is needed; And autonomous underwater drones can measure currents, search for enemy vessels, and sweep for mines while simultaneously relaying the information back to a U.S. command center or ship (Singer, 2008).

Of course, these technologies have also made their way into public life. Commuters use GPS technology in their cars to navigate in cities and on highways—and they can receive up-to-the-minute information on traffic conditions down the road. iPods are equipped with applications that can provide real-time information about weather conditions along with a long-term forecast. Google Earth® can let someone zoom in from satellite images to see anywhere on the globe. And the list goes on. However impressive these technologies may be, I mention them

here not to marvel at them, but to point out how the logic of situational awareness has become ingrained in civilian culture. For example, in its coverage of the 2008 Presidential election, CNN implemented such technology to show polling data from every district in the United States, and anchor John King would turn to "the board" to zoom in and out of different areas on the map with his finger—if for no other reason than to show the power of the "new" technology. Not only was the news happening in real-time, it was being framed and reframed in real-time.[20]

Again, the point is not that technology is "speeding up," or that several technologies have been integrated to operate in concert with one another—each would be a subject unto itself, and media scholars have written extensively about these trends already. Rather, the point is that technologies meant to enhance situational awareness—whether in the context of battle or for civilian uses—implicitly advance the idea that complex phenomena can be reduced to real-time measurements and then responded to accordingly. One popular manifestation of this logic is found in the detailed monitoring, modeling, and forecasting of meteorological events. For years, local weather forecasters have integrated radar, satellite imaging, and computer modeling technologies to predict future weather patterns and present their findings to the public. Using these technologies, weather forecasters discuss high-pressure troughs, frontal boundaries, jet streams, and other meteorological events to the extent that these phenomena could influence future weather events in the viewing area. Within this general body of discourse, weather is seen as an ongoing, unstoppable phenomenon—but long-term climatic factors contributing to current (and future) conditions are seldom discussed at length. Instead, the focus of such discourse is on

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[20] Other examples of public uses of such technology include daytraders' use of real-time technology to monitor market trends and company reports, and Wal-mart's implementation of data-gathering devices meant to provide the company with real-time, macro level situational awareness about its consumers, its suppliers, and other data within its markets.

the present—the real-time—and the immediate future. Perhaps this is due to the limited amounts of time news stations can devote to the subject, but whatever the reason for framing the weather in this manner, the underlying message is that macro-level causes of weather events are ancillary to the situational awareness afforded by the aforementioned technologies; that because weather events are inevitable, the focus of the public should be on the real-time present and the immediate future.

To a large extent, much discourse about terrorism (and war in general) parallels the modus operandi of weather forecasting. Following the logic of situational awareness, this discourse shifts the public's focus away from deliberative frameworks and toward immediate exigencies dictated by the streaming data of information gathering technologies. For example, the U.S. Air Force Office of Scientific Research funded a project at the University of Maryland's Institute for Advanced Computer Studies designed to "forecast terrorist organizations' future behavior" (Walsh, 2008). The project devised a program called the SOMA Terror Organization Portal (STOP), which uses complex algorithms and enormous sets of data to predict the behavior of thirty groups of interest (such as Hezbollah and Hamas).[21] Though the program is advertised as a "virtual roundtable that terrorism experts can gather around and form a rich community that transcends artificial boundaries," the underlying message is that future terrorism can be predicted in a manner similar to weather forecasts, which reinforces the "need" for technologies devoted to further situational awareness.

The weather forecasting approach to terrorism and insurgency has not gone unnoticed in

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[21] The title of the STOP program uses an acronym within an acronym. SOMA stands for Stochastic Opponents Modeling Agents, but it is also a vague reference to the drug "soma" in the novel Brave New World, which is used to control populations and prevent political action against society's hegemonic order.

public discourse: *Wired Magazine* ran a story in 2007 about how the Pentagon "is paying Lockheed Martin to try to predict insurgencies and civil unrest like the weather" (Schachtman, 2007). The story chronicles how Lockheed won a $1.3 million contract from the Defense Department to develop the Integrated Crisis Early Warning System (ICEWS), which will allow military commanders to "anticipate and respond to worldwide political crises and predict events of interest and stability of countries of interest with greater than 80 percent accuracy." To be fair, the article acknowledges a certain level of skepticism among experts and citizens alike. For instance, Lieutenant Colonel John Nagl, who helped write the Army's manual on defusing insurgencies, said to the magazine, "Wait a minute, you can't tell me who's going to win a football game. And now you're going to replicate free will?" Clearly, many of the article's online readers echoed this sentiment as well: one respondent wrote sardonically, "Brilliant! Only the acronym doesn't really work. How about, Strategic Human Interaction Theory—or SHIT?" Despite the skepticism about the capabilities of ICEWS, however, the article's message is clear: that whether or not the technology in question is successful, the military's basic approach to terrorism and other related phenomena is to cast them as meteorological events that can be forecasted.

As indicated by public reactions to STOP and ICEWS, many people remain skeptical about the abilities of such technologies—and probably for good reason. What is interesting about their sardonic approaches to the idea of weather warfare, however, is that it plays directly into the tendency for such discourse to shift deliberation about war into the technical sphere. Debate becomes about the abilities of technology, rather than about the implications of approaching war as a natural phenomenon. And perhaps more tellingly, the tone of this discourse is often heavily sarcastic and cynical, which may reflect another important

consequence of "naturalizing" war: that the complexities of these constructions of warfare threaten a public's perception of agency and involvement in deliberation about its military's affairs. That is, if war is to be considered as complex as the intricacies of the world's ecological systems, then citizens are relegated to being spectators while the technologies of "situational awareness" whirl away on their behalf. With their agency threatened, the public's natural recourse is to disengage with serious deliberation and instead adopt a detached, cynical attitude toward the actions of its government—thus resulting in the responses observed in discussions about weather warfare.

Another example of this effect comes in the form of responses to the U.S. government's National Threat Advisory (NTA) indicator, which was unveiled to the public as part of the Homeland Security Advisory System (HSAS) in the months following the September 11th attacks. Created by Homeland Security Presidential Directive 3, the advisory system was meant to be "the foundation for building a comprehensive and effective communications structure for the dissemination of information regarding the risk of terrorist attacks to all levels of government and the American people" (Chronology, 2009); however, it was quickly met with public ridicule and became the butt of many jokes (Meserve, 2009). The NTA's five colored bar is supposed to represent the perceived threat level of the nation, but it bears an unfortunate resemblance to meteorological indicators, such as barometers or tornado advisory systems—devices which themselves are often mocked (or at least, largely ignored) by the public. Once again, the NTA is another instance in which the public is met with a construction of war as a natural phenomenon; and once again, this construction *diffuses* the "threat" of war so it extends into the paraphernalia of everyday life (in this case, airport operations) and simultaneously *defuses* public engagements with the military apparatus and the merits of warfare.

Time and again, when war and its associated content is constructed within the framework of natural phenomena—and in particular, natural disasters—the typical public response is one of disengagement and detachment from the deliberative process once inextricably linked to the Clausewitzian purview of war as a "continuation of politics by other means." This is not to say that war is *only* constructed in this manner—clearly there are many other rhetorical frameworks at play in discourse about a subject as nebulous as war. And yet, this particular body of discourse continues to shape the United States' fundamental conceptualizations about warfare in the Twenty-First Century. In fact, President Obama's appointed Secretary of Homeland Security has opted to reframe terrorism as a kind of "man-caused disaster," a term which signals an ongoing infusion of the "Rhetoric of Disaster" into deliberation about war.[22] These constructions of war, like so many others, create an atmosphere in which the public sphere gives way to the technical sphere—and the public is left with limited means of asserting agency in the face of "disaster" after "disaster." In the next chapter, I will address how the discursive convergence of "war" and "nature" is also inscribed on a material level. By chronicling the rise of bio-mimetic robots and drones, I hope to further delineate the trajectory of this discourse in the public sphere.

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[22] To be fair, though, the term at least acknowledges some level of causality in warfare and implies a more direct relationship between the public and its government's actions.

CHAPTER 3

THE WAR MACHINE GOES "GREEN": CONSTRUCTING ETHOS IN THE BIOMIMETIC AESTHETICS OF POST-INDUSTRIAL WARFARE

> "You know, I have one simple request. And that is to have sharks with frickin' laser beams attached to their heads! Now evidently my cycloptic colleague informs me that that cannot be done. Ah, would you remind me what I pay you people for, honestly? Throw me a bone here!"
>
> --Dr. Evil, *Austin Powers: International Man of Mystery* (1997)

> "[Biomimetics] is not so much a subject matter as it is a point of view. It is an approach to problems of biological science utilizing the theory and technology of the physical sciences. Conversely, biophysics is also a biologist's approach to problems of physical science and engineering, although this aspect has largely been neglected."
>
> –Otto Schmitt (Harkness, 2001)

Introduction: Mean, green, fighting machines!

In the fall and winter of 1992, the RAND corporation conducted a workshop for the Defense Advanced Research Projects Agency (DARPA) on "Future Technology-Driven Revolutions in Military Operations." The ostensible purpose of the workshop was to identify technologies beyond the DARPA research agenda (at the time) that could "bring about revolutions in military operations over the next 20 years," but during the first session, each of the 93 workshop participants was asked to do something peculiar: they were to organize into "concept groups" and create "application metaphors" for the technologies under consideration at the conference (Hundley & Gritton, 1994). According to the conference report, the exercise yielded "several new application metaphors," which were then selected for "more in-depth consideration." (Hundley & Gritton, 1994). By the end of the process, leaders from several military-funded research programs identified five major application metaphors that would likely

drive future research projects. Interestingly, at a time when Gulf War coverage highlighted the mechanized developments in war technologies (e.g. "Smart" bombs, Patriot and Scud missiles, and the Stealth Bomber), the first two metaphors selected at the conference—the "Fly on the Wall" and "Turning the Fly into a Wasp"—suggested the aesthetics of future military technologies would perhaps become more organic than the heavily mechanized conflicts of the Twentieth Century. In other words, U.S. military research was about to feature nature as a guiding metaphor for its next generation of innovations.

Almost twenty years later, it appears the researchers at the RAND workshop may have been onto something: Since the workshop, military-funded projects have yielded remote-controlled live rats, cyborg moths, and robotic roaches. Robotic lobsters comb the ocean floor in search of mines, and DARPA, the military's leading research apparatus, has devoted an entire branch of research to projects "whose goal is to incorporate biological evolutionary strategies into new animals or robots that can detect and report the presence of environmental dangers" (Sassoon, 2004).[23] Not surprisingly, this outcropping of biologically-inspired DARPA projects has attracted media attention and public scrutiny. As one journalist put it:

> "As evidenced by their [infamous] Vietnam-era mechanical elephant project and a recent grant to researchers developing a robotic canine called "Big Dog" for the Army, DARPA might be said to have something of an animal fetish, reflected perhaps in various projects whose very names evoke the ethos of the wild kingdom" (Turse, 2004).

As scientists continue to develop autonomous robotic fish, snakes, and yes, even living sharks with microprocessors in their brains, it may be said that the aesthetics of war are undergoing a

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[23] According to the DARPA website, the program is called "Controlled Biological and Biomimetic Systems."

metamorphosis of sorts—or at least, a particular species of war aesthetic has emerged as a significant feature of military designs (Shachtman, 2007).

In the previous chapter, I outlined how similar developments have occurred within the more general framework of public discourse about contemporary warfare. Frequently, military endeavors are packaged as natural phenomena, and these constructions of war entail a particular way of positioning the public in relation to its deliberative institutions and, of course, its military apparatus. Similarly, material developments in military technology suggest biomimicry has gained traction as a galvanizing concept for the U.S. military—and as I hope to demonstrate herein, these material iterations of biomimetics also frame public discourse (about military endeavors) in a particular way.[24]

In this chapter, I consider the implications of the biomimetic war aesthetic, and I analyze public discourse about military applications of biomimetic designs in an attempt to provide a cursory taxonomy of common tropes that function as ethos-constructing devices. After sampling hundreds of instances of public discourse[25] about the military's efforts to incorporate biomimicry into various elements of its operations, three basic tropes emerged: First, and perhaps most commonly, these discussions contain some variation of the logic that nature is infallible, and that it just makes "common sense" to use biomimetic designs when constructing robots, weapons,

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[24] Of course, I do not mean to imply a clear-cut distinction between discursive and material developments. I acknowledge such a distinction could be considered problematic, depending on one's proclivity to materialist rhetoric—but I make the distinction here only as an organizational tool. Indeed, part of the point of this project is to problematize many of the arbitrary boundaries that once framed war discourse, including the boundary of materiality and immateriality in military affairs.

[25] Sources range from major news outlets and technology-oriented magazines like *Popular Science* and *Wired Magazine* to publicly-released military documents and relevant artifacts from popular culture.

and other associated items. Second, military entities like DARPA often preface their uses of biomimetic designs with some variation of the claim that not only are they re-creating life (quite literally), but they intend to use the technology strictly for life-saving, or non-lethal operations—which is an interesting position for a military entity to take. And third, articles about military uses of biomimetics tend to reflect upon the ethical (and strategic) implications of using such technologies, but usually do so by way of considering the so-called "changing face of warfare."[26] Subsequently, I will consider how rhetorics of biomimicry operate as ethos-constructing devices—but first I would like to begin with a brief overview of how this analysis fits within the greater context of public discourse about military affairs.

The emergence of a bio-logical military[27]

> "There's nothing like having four billion years of R&D at your back."
> –Kenny Ausubel, Founder of Bioneers (Heimbuch, 2008)

Generally speaking, Western military doctrine has reflected many of the epistemological and ontological underpinnings associated with Western thought. In fact, in many cases it has been argued that technological developments on the battlefield influenced Western society's understanding of itself and the socio-political landscape around them (Boot, 2006; Bousquet, 2009; Chow, 2006; DeLanda, 1990; der Derian, 2009; Virilio, 1989). In some cases, technologies that seem unrelated to military endeavors may contribute significantly to both

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[26] Granted, each of these tropes is used for varied effects, and there are other subtexts that contribute to this body of discourse (which I will also address), but I will analyze these three tropes in terms of how they operate to construct ethos within the greater framework of war discourse.

[27] I use the term "bio-logical" here to point out a tendency to use biological phenomena as inspiration for the logic underpinning military doctrine and technology—and NOT as a reference to biological warfare (which merely refers to using diseases, bacteria, and other naturally-occurring substances as weapons of mass destruction. Biomimetics may share some of the characteristics of biological warfare, but it is important not to conflate the two.

military doctrine and society at large. For example, Antoine Bousquet (2009) notes that the invention of the mechanized clock impacted the basic organizational structure of militaries from Frederick the Great's highly regimented Prussian forces all the way up to World War I, when thermodynamics took over as the galvanizing metaphor driving military endeavors. Of course, as Bousquet notes, each successive era of warfare builds upon the vestiges left behind by the previous era of war technology, and no single era exists in a vacuum. Perhaps most importantly though, Bousquet emphasizes that while science and militarism have generally had a symbiotic relationship throughout history, the two have become inextricably woven together in a feedback loop of invention and destruction, resulting in what he calls a "*Scientific Way of Warfare*." He writes:

> "From the ascendancy of the scientific worldview in the seventeenth and eighteenth centuries to present day, an ever more intimate symbiosis between science and warfare has established itself with the increasing reliance on the development and integration of technology within complex social assemblages of war" (p. 3).

Whether one chooses to use Bousquet's terminology (Mechanistic, Thermodynamic, Cybernetic, and Chaoplexic warfare) or more familiar terms (like "Industrial," "Post-Industrial," "Network-Centric," and/or Hardt and Negri's "Multitude") to depict transformational periods in military history, it is clear that technological developments on (and off) the battlefield operate in close association with the discursive and aesthetic frameworks that define a society's relationship with its militarized appendages.[28] Concomitantly, the "application metaphors" that guide

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[28] For Bousquet, an example of this relationship occurred during the Cold War, which he categorizes as part of the era of thermodynamic warfare. The zero-sum strategies and containment doctrines that defined a so-called "cold" war reflected the homeostatic principles of thermodynamics.

military research appear to operate in a feedback loop with material developments in military technology. This relationship—between the aesthetic themes of warfare and the public discourse about them—is far from superficial. Developments on each of these fronts reveals, frames, and shapes the manner in which a nation engages its military and its foreign policy. What, then, may we gather from the military's growing interest in biomimetics? How are these developments constructed in public discourse, and what are the implications for the relationship between the U.S. military and its citizenry?

Before I address these questions, let me first dispense with the notion that natural, or biomimetic, qualities were ever completely absent from military affairs—or that, by extension, its associated discourses are endemic only to the relatively recent developments in so-called "warbots" and other associated military technologies. Indeed, militaries throughout history have occasionally taken cues from nature as blueprints for their weapons and fighting styles.[29] Even at the turn of the Twentieth Century, as assorted technologies paved the way for the highly mechanized and metallic "industrial" era of warfare, artists such as Pablo Picasso were conscripted into the militaries of World War I to produce the first camouflage—that is, patterns modeled after nature—to be used as part of official military strategy and tactics (Blechman, 2004).

In fact, the emergence of military camouflage itself is a perfect example of (1) biomimetic aesthetics in the military and (2) how inventions for the battlefield shape—and are shaped by—the cultural dynamics of the military-public interface. Although camouflage

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[29] The militaries I refer to, of course, come most directly from Western civilizations throughout history—although I presume at least some elements of biomimicry were present in Native American and Non-European cultures' combat strategies and tactics, perhaps even to a greater extent.

practices had been on the periphery of the military tactics for centuries (dating back to prehistoric hunter-gatherers wearing animal capes), World War I marked the first time official military strategy acknowledged camouflage as a useful component in the designs of warfare.[30] Leading up to the war, use of camouflage was sporadic—but when the war began, the French promptly created the first official camouflage department (*section de camouflage*) in 1915. Artists contributed to the war effort by designing camouflage patterns based on Cubism and Gestalt psychology. In an effort to throw off the timing of enemy submarines (which had to aim its torpedoes based on a calculation of the range and speed of the target), military ships (and some civilian liners) were painted with "dazzle" camouflage. In the trenches of Europe, artists constructed fake soldier heads and fake observation posts to hold above the trench in hope to draw enemy fire away from their live counterparts. Clearly, the merging of war and art—and the convergence of form and function—had commenced on the battlefield.

Yet following the industrial wars, camouflage—and more specifically, camouflage aesthetics—began to "spill over" into various aspects of the public sphere. After World War II, military "surplus" stores were established across the nation, allowing for the soldier's uniform to make its way into civilian life. Although "civilian camouflage" during the period closely resembled military attire (and in many cases, was an actual soldier's uniform), it appears that citizens began to refashion camouflage's symbolic meanings. From anti-war protestors to civil rights demonstrators to Vietnam veterans, citizens reappropriated camouflage's once-militant ideological associations for "peaceful" endeavors. Perhaps it is appropriate that in an age of deterrence—when the atomic flash had imprinted itself on the American psyche—camouflage

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[30] Many point out that the extended effective range of weapons used in World War I produced a necessity to hide from sight, for "if it could be seen, it could be destroyed" (Virilio, 1989).

itself came to represent strategies of avoiding conflict. Today, as camouflage becomes increasingly ubiquitous—appearing on everyday consumer products like diapers and wallets to featured clothing lines on high fashion runways—it "stands out" as a rich symbol of the capacity for military aesthetic choices to radiate outward into popular culture.

The emergence of camouflage into popular culture speaks to the diffuse web of institutions, technologies, and social practices that reify the aesthetic dimensions of warfare both on the battlefield and in the public sphere. While camouflage may have been "introduced" on the battlefield as a response to the advent of the camera (and longer-range weaponry), it eventually spread outward into the social milieu, where it was co-opted, repurposed, and then returned to the military as much a powerful symbol as it was a battlefield tactic.

Moving beyond this process of subversion and containment (or co-optation), James der Derian (2009) introduces what he calls the Military-Industrial-Media-Entertainment Network (MIME-NET). According to der Derian, the unwieldy acronym refers to the rich diffusion of public, private, and military entities that operate in concert—and also autonomously—to produce and reproduce the ethos of what he calls "virtuous war." For him, "technology in the service of virtue has given rise to a global form of virtual violence, *virtuous war*" (p. xi). That is, technology and discourse emanating from within the MIME-NET operates to produce an ethos for warfare in which military violence is justified—and often glorified—because it is considered a "high-tech" endeavor.

Still, MIME-NET only begins to describe how developments in biomimetic technology fit within militarism's expansion into everyday life. In one sense, relatively recent inventions like the Spinybot—a robot designed after a gecko that can climb walls without using adhesives—or the DARPA project that equipped rats "with radios that transmit their brainwaves" (enabling

scientists to steer the rats via remote) suggest that the military is taking more than a passing interest in biomimetics. In fact, for some people in the defense industry, biomimetics is an organizing principle from which many national security efforts can derive inspiration. As a defense "expert" stated in an interview with *New Scientist*,

> "You can look at virtually any question about security through a biological lens, from how to develop weapons systems to how to organise government departments. You look at what the most successful organisms do to solve their security problems, and then you try to use that….You can see this through many levels of biological organisation, in the immune system, for example, or in colonial organisms such as ants and corals" (Whitfield, 2008).

At first glance, this quotation may not appear to be terribly revealing. To be sure, it conveys the relatively straightforward point that biology can be a rich source of inspiration for invention. Perhaps more importantly, though, it alludes to one of the most prominent tropes that surfaces in discussions of military uses of biomimetics: that "nature" represents perfection—an ideal—and that it only "makes sense" to model the technologies of war after something time-tested (and, one might say, Evolution-approved). In the next section, I consider the implications of this trope vis-à-vis other rhetorics of design.

Nature as "Pure Design"

Indeed, much public discourse frames researchers who implement biomimetic designs as people who are merely using "common sense," as if guided by some cosmic force in their design choices. A caption in *Engineering Design* typifies this kind of claim: "Inspired by designs *already perfected in nature*, these [biomimetic] robots are helping military units accomplish missions with less risk to soldiers and civilians" (Edwards, 2008, emphasis added). Or, as one

military roboticist tells his interviewer, "Flies have 100 million years of evolution to tell them how to fly. We're not going to be there instantly" (Squatriglia, 1999).[31]

As I will hope to demonstrate, the construction of nature as a perfect "ideal to follow" interacts with other components of war discourse to form a peculiar, if not paradoxical, ethos for U.S. military endeavors. To elaborate on this point, let me first address some of the more obvious rhetorical elements present in this body of discourse. For one, if nature is infallible (as is frequently presumed), then the implication is that biomimetic war designs instantly enhance a given war technology's ethos as an acceptable development, as if it had been chosen through natural selection. That is, if one had to choose between using a synthetic poison gas and a naturally occurring poison gas, presumably it would be "better" to use the naturally occurring poison gas. Of course, this kind of reasoning also reinforces the notion that military intervention, if it's sufficiently biomimetic, is a naturally occurring, inevitable phenomenon—and it once again shifts attention toward the merits of a technological design aesthetic and away from public deliberation about the merits of a given military engagement, or even of war itself. After all, the suggestion goes, if it's good enough for nature, then it should be good enough for the battlefield (i.e. military use).

Upon further inspection, however, the "nature as perfect design" argument also reveals a set of paradoxes about the U.S. military's biomimetic line of products. First, as I have already

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[31] One might argue that the trope of "common sense" design is a significant part of discussions about biomimetics in general, regardless of whether or not it is used in military applications—which is generally correct. Even in *Biomimicry* (Benyus, 1997), the book that is often credited with bringing the term "biomimicry" into popular culture, the basic premise of the book is that people ought to incorporate biomimetic design into their everyday lives because it just "makes sense." I will address this point later in the chapter, as it relates more closely to another portion of my analysis—but I wanted to acknowledge the point here to pre-empt such an objection.

pointed out, one tendency in coverage of U.S. military technology is to use the disparity in technological advancements between the U.S. and its enemies as prima facie justification for the U.S. military's moral superiority.[32] In one sense, biomimetic technologies would fit within this narrative, because if nature is the ultimate blueprint for design, then the army who designs itself most directly after nature and natural processes would be considered the most technologically advanced—and would presumably possess instant "moral superiority." But in the context of previous coverage about military technology, we see that this is not quite how military ethos gets constructed. Generally, stories about technology divides are covered from a Western (specifically modernist) perspective, meaning that "technology" is discussed as something *outside* of nature that shapes or affects its surrounding environment—not the other way around. In many ways, this understanding of technology positions the weapons and tools of war (if such a distinction can be made) as anathema to naturally occurring phenomena. Even in broader terms, saying it "just makes sense" to model weaponry and other devices after nature—that biomimetics are simpler, less complex designs—runs counter to the more intuitive notion that the more complex a given technology is, the more advanced it must be, and vice versa. It would seem, then, that adopting biomimetic qualities would undercut the super-natural qualities so often attributed to U.S. military technologies.

Similarly, by invoking nature as the preeminent blueprint for achieving efficiency, discussions of biomimetics frequently imply that it is a "pure function" design, reminiscent of modernist renditions of engineering, architecture, and aesthetics. Joseph Ayers, the inventor of Robolobster (a lobster-like robot that systematically combs the ocean floor in search of mines), puts it succinctly:

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[32] See also (Virilio, 2005); (Ivie, 2007); (Aksoy & Robins, 1991).

> "Even the simplest animals outperform any known robot, especially in autonomous operations….Animals have performance advantages, and we're trying to capture these advantages in an engineered solution" (Edwards, 2008).

From this perspective, biomimetic designs are merely selected to replicate the "performance advantages" of animals and the rest of the natural world, irrespective of the connotations evoked by this *choice* in design. In a sense, then, this kind of reasoning frames biomimetic aesthetics as a lack-model—as an-aesthetic—in much the same manner that Le Corbusier argued he could create a "purely functional" architecture in Paris.[33]

Yet from phenomenological approaches to technology[34] to postmodern critiques of everyday life[35], it has been repeatedly argued that rhetorics of functional design fail to acknowledge the communicative, intermediating functions that all aesthetic design choices perform. Even military strategists have acknowledged this point by making conscious efforts to incorporate biomimetic designs into psychological operations on enemies. Eliot Cohen, the Director of the Project for a New American Century and Professor of Strategic Studies at Johns Hopkins University, has proclaimed:

> "We will have to figure out how to maximize the psychological impact of it [a robot]. We will have to think not merely in terms of costs and benefits and how to get steel on

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[33] In his 1925 Vision of Paris, Le Corbusier proposed to knock down the entire Marais district on the Right Bank and replace it with rows of identical towers set between freeways. Although the plan was never adopted, it is said to have influenced designs of many American housing projects, namely Chicago's Cabrini Green district (de Botton, 2006).

[34] See (Heidegger, 1977); (Ihde, 1977), (Latour, 2004). Granted, each approaches phenomenology in his own way, but one of the basic premises of their studies concerning technology is that "pure function" design is just that: a design aesthetic.

[35] See also (Baudrillard, 1981); (De Certeau, 1984); (Harold, 2009); (Jamison, 2007), to name just a few.

> target, but much more….we [ought to] exploit the basic human fear of bugs" (Singer, 2009, pg. 304)

Apparently, Cohen is not alone in his sentiment that biomimetic designs could have a devastating psychological effect on the battlefield: DARPA is said to have fielded a request to design an Unmanned Aerial Vehicle (UAV) after the intimidating red-eyed Hunter-Killers from the *Terminator* movies (Singer, 2009), and one study at the Airforce Research Laboratory (Clough, n.d.) could hardly contain its excitement about the potential psychological effect swarming robots might have on the battlefield:

> "Swarms. Just the word conjures up visions of bugs enveloping humans screaming and writhing in agony. There is just something about the human psyche that causes it to cringe when the 'swarm' word is used….We could leverage that fear to assist psychological operations….We could make sure the swarming vehicles look the part, making them mimic invertebrates humans naturally fear, such as wasps or spiders. We could make them look nasty" (p. 10).

On one level, these kinds of statements are reminiscent of the highly publicized rhetoric of "Shock and Awe" that coincided the bombing campaign-cum-media spectacle that marked the beginning of the Iraq War in 2003. Perhaps the worst kept secret of "Shock and Awe" doctrine was that the military would feature psychological operations as the lynchpin for its approach to prosecuting the war in Iraq (and beyond). Draped in technofetishism and "virtuous" war rhetoric (i.e. implying that "precision" killing is somehow less reprehensible than indiscriminately killing masses of people), "Shock and Awe" was as much a marketing campaign to construct the U.S. military's ethos (as an "awesome" mythical deity/ undeniable force) as it was a tactical principle.

Likewise, designing robots that would exploit "basic human fears" is part and parcel to

this trajectory in military affairs, in which information warfare and "information bombs" preside over both the immaterial and material battlespaces of modern conflicts (Virilio, 2000). Within this framework, the once clearly defined boundaries between form and function (or at least, the boundary between their rhetorical constructs) dissolve behind the imperative for the war machine to insinuate itself within every social field (Deleuze & Guattari, 1986).[36] In the context of biomimetic design, this presents an interesting paradox: acknowledging the potential psychological effects of biologically-inspired "warbots" directly contradicts the notion that biomimicry represents a "pure functionalism," devoid of aesthetic choice. That is, on the one hand, biomimetic designs are rationalized within a modernist framework that idealizes pure function design over supposed human contrivances. Although it never explicitly uses his terminology, this approach is closely aligned with Benjamin's (1978) argument that "mimesis" is a means of thwarting "alienation" through a conceptual affinity with the "natural environment." In other words, biomimicry would presumably restore the use value of an object by re-engaging it with that which exists outside the modes of production (i.e. nature).

On the other hand, however, biomimetics is framed as a potentially powerful symbol that builds upon the ethos of nature to evoke passive reverence both among enemies and in the public sphere (thereby problematizing the standard form/function divide). Another example of the latter point is when a story or document conceives of biomimetic design as a way of "improving" or "adding to" nature's perfection. Instead of merely replicating the supposedly flawless features found in nature, this approach portrays researchers who use biomimetics as taking the "next

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[36] It is important to note that Deleuze & Guattari use the term "war machine" to refer to a kind of assemblage structure that surfaces in many things ranging from ant colonies to the actual Pentagon war machine. I, too, am using the term "war machine" metaphorically both here and in the chapter's title, even though in this case it more directly refers to the military apparatus.

step" in the evolutionary process of engineering design. For instance, an article about an autonomous minesweeping "RoboLobster" states:

> "In the case of RoboLobster, the system can even be adapted to *improve upon nature*. The robot can, for example, be built with "claws" created out of explosives, designed for use in a suicide mine-detonation mission" (Edwards, 2008, emphasis added).

Or, as the President of Boston Dynamics stated to *The New York Times*:

> "We don't slavishly imitate what evolution has created…My dream is for any part of the robot to look like a machine, and when it moves, you go, 'Wow, it's an animal'" (Kirsner, 2004).[37]

In a sense, this kind of discourse attempts to reconcile the apparent contradiction between "nature as perfect design" rhetoric and conceptualizations that emphasize its symbolic capacity (as a potential weapon in psychological warfare): Claiming biomimetic design is an "improvement upon nature" simultaneously invokes the rhetoric of functionality along with an acknowledgement of the immaterial components present in all designs. And, like the other two approaches to framing discourse about biomimetic military technologies, this type of argument is often deployed as a mechanism that reinforces the "virtuous war" ethos (i.e. scientific might makes right) by way of constructing biomimetic designs as "gee whiz" technologies. Ultimately then, the question concerning military ethos is what drives much of the coverage about biomimetics—whether it appears in a text from popular culture or in one of the more esoteric academic design journals.

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[37] Boston Dynamics is responsible for the "Big Dog" project, which is essentially a headless, four-legged robotic pack mule designed to autonomously navigate any terrain without falling. In early 2010, the company was awarded $32 million by DARPA to create the LS3—a larger version of the Big Dog that will be able to carry a 400 pound load 20 miles without refueling and be able to jump over obstacles without falling.

Indeed, by implying that biomimesis moves beyond mere imitation or re-creation of the natural world and instead actively *creates* life, the "perfecting nature's design" rhetoric calls attention to some interesting ethical considerations about warfare that underpin this body of discourse. In the next section, I will elaborate on this point by considering how discussions of biomimetic technologies fit within the biopolitical components of the military-vital complex.

Weapons of mass creation

> "It's kind of hard to imagine a fighting lobster."
> --Joseph Ayers, inventor of RoboLobster (Edwards, 2008)

As Hardt and Negri (2004) argue, the latest Revolution in Military Affairs featured a shift toward technologies meant to preserve life. Following the Vietnam war, the public consciousness was acutely sensitive to the disturbing images produced by wars of attrition, and around the time the draft was abandoned in favor of a fully volunteer army, rhetorics of precision weaponry and "surgical strikes" began to surface. Not only were soldiers' lives to be spared at all cost, but the idea of a more discriminate "virtuous warfare" also became popular. Perhaps more importantly, though, military doctrine began to exhibit biopolitical qualities in its drive toward network-centric warfare. That is, rather than simply attempting to preserve life, the military—in conjunction with the rest of the MIME-NET—became increasingly preoccupied with using biopower to discipline, regulate, and even *produce* life.

Ultimately, the logic of biopolitics would play an important role in shaping conceptions of how military robotics could be applied to everyday life. For example, shortly after the September 11th attacks, the security industry was booming as inventors, entrepreneurs, and mercenaries alike vied to cash in on the nation's renewed interest in streamlining disaster response efforts. In particular, the question of how to locate and rescue people buried under rubble led many to conclude it was time to conscript robotics into life-saving search and rescue

operations. In September of 2001, a *New York Times* article entitled "Agile in Crisis, Robots Show Their Mettle" clamored for an uptick in the deployment of unmanned systems during search and rescue missions. It argued the few robots used during the search and rescue period at Ground Zero were "rescuers [that] are unaffected by the carnage, dust, and smoke that envelop the remains of the World Trade Center. They are immune to the fatigue and heartbreak that hang in the air" (Lee, 2001). Again, we see that the technology-driven approach to search and rescue is proselytized as superior to—or more highly evolved than—so-called "low-tech" approaches to the same problem. The more interesting part of this quotation, however, is that it considers robots as acting subjects—as "rescuers"—in and of themselves (which deviates from Western understandings of the relationship between subjects and objects).

In the ensuing years, the idea of robot rescuers would continue to inspire a wide assortment of biomimetic robot and cyborg designs. One scientist created the "Snakebot," which is an autonomous snake-like robot that can slither through small holes and climb walls (Pavlus, 2009); Researchers at Texas A&M University (among others) developed a method of controlling the movements of cockroaches via remote (Wright, 2010); and researchers at State University of New York (again, one among many) used similar methods to control rats via remote (Harder, 2002). While much of the coverage about these inventions acknowledges a wide variety of possible applications in which such technologies may prove useful, it is the non-lethal (and/or life-saving) applications that typically receive attention in the media. From remote-controlled rats burrowing through rubble on search and rescue missions (Harder, 2002) to minesweeping lobsters (Kirsner, 2004) to cyborg spy moths (Richards, 2007), biomimetic technologies are routinely cast as non-lethal alternatives to the violent appendages of military research.

In the same vein, potentially dangerous developments in military technology are

nonchalantly dismissed as merely the latest gadgets to be used exclusively on enemy combatants. For instance, rather than raising concerns about the potential for covert domestic usage of biomimetic spybots, coverage of bio-inspired UAVs tends to focus on how they might be used specifically to locate and spy on Osama bin Laden and other high-level terrorists (Hurst, 2006; Richards, 2009). In constrast, however, responses to these articles almost always underscore the potential for these technologies to be used domestically for nefarious purposes.[38] The apparent disconnect between these two approaches is also underscored when attention turns to the ethical implications these technologies might have for future wars. On the one hand, biomimicry is portrayed as an advancement in technology that could help war become more discriminate, and therefore (under the logic of "virtuous war") more acceptable from an ethical standpoint. On the other hand, however, there is a commonly held concern that such technologies will eliminate the "human risk" inherent in previous wars and therefore lower the threshold for a nation (particularly the United States) to engage in armed conflicts throughout the world. P.W. Singer identifies this apparent tension in discourse about future wars (that would presumably implement biomimetic and other so-called "life-saving" technologies on the battlefield):

> "A fascinating consensus across the disparate groups I met with for the book was that being able to move more and more Americans out of harm's way may save lives, but also will change our very decisions on when and where to use force. 'They [biomimetic and other unmanned systems] lower the threshold for going to war. They make it easier, make war more palatable,' said one. 'Anything that makes it morally and ethically easier to

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[38] It is difficult to quantify such things, but I would estimate this is one of the two most prominent themes in the comments sections (below online articles) about biomimetic technologies. The other, I would argue, is a healthy skepticism about the functionality of these devices coupled with a concern that these projects are a waste of tax dollars.

> wage war is not necessarily a good thing,' another said. Tellingly, the first quote is from a human rights expert, whose job entailed trying to shut down the prison at Guantánamo Bay; the second is from a special operations officer just back from hunting terrorists to lock up there" (Schachtman, February 2009).

To be sure, these ethical considerations about future uses of military technology may be interesting to consider in and of themselves—but I mention them here to point out that, in either case, these constructions presume these technologies to be inherently "life-saving" entities. This calls attention to another dimension of this discourse: Namely, foregrounding the life-saving—or, in some cases, life-creating—applications of these technologies imbues military uses of biomimetics with an ethos that dovetails with its apparent quest for biopolitical dominance in the Twenty-First Century. That is, by advancing the premise that "nature is good," biomimetics allows the military to be cast as merciful regulators of the global socio-political landscape (rather than as a technological bully). This kind of "bio-oriented technofetishism" points to a telos, or drive, in post-industrial military affairs in which the military apparatus endeavors to implicate itself into the interstices of everyday life. As Hardt & Negri (2004) argue, war and its associated content thus become part of the everyday, rather than a state of exception. It is no surprise, then, that discourse about biomimetic war circulates throughout the public sphere in various movies (including the *Terminator* series and *Avatar*, for example), magazines, and other artifacts of popular culture.[39]

Yet unlike many popular understandings of the "military-industrial complex"—or even of its variations, like MIME-NET—the biomimetic impulse suggests something beyond a "mere

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[39] Again, this process operates in a kind of "feedback loop" with developments in military affairs.

imitation," or co-optation, of the everyday. Specifically, each new biomimetic technology represents an attempt to reshape, reframe, and reposition the military appendage as endemic to (and inextricable from) everyday life itself. So while some may see the military's use of biomimetics as yet another example of wasteful spending on hare-brained projects—and while many others focus on the debate about the functionality (or feasibility) of biomimetics—these analyses often miss a potentially larger point about the way the *idea* of biomimetics constructs military ethos and reframes discourse about developments in military operations. At once, biomimetics advances the "spectacular" nature of the post-industrial war aesthetic by bringing the battlefield into the public's proverbial backyard; but it also represents a kind of camouflage in which the military apparatus appears to dissolve into a perfect simulacrum of what is considered "natural." And so, while it may indeed be difficult to imagine a fighting lobster (as stated in the epigraph above), it may very well be that the lobster will continue to guide our thinking about warfare for the foreseeable future.

CHAPTER 4

CONCLUSIONS

> "Go wild with the robotic submarine stalkers, the lightning harnessing, and the cyborg insect spies. Just…give this BioDesign thing a bit more thought."
>
> –Jeremy Hsu (2008)

While there have been elements of biomimicry in military applications throughout history, biomimesis has emerged as a prominent trope in considerations of what the "face of war" should look like. This project may best be described as an attempt to point out the convergence of various phenomena that contribute to this trope in discourse about military affairs. First, by mapping out the trajectories of warfare in the Twentieth and Twenty-First Centuries, this project is meant to depict the encroachment—or convergence—of military affairs into everyday life. From civilian battlefields to the conscription of aesthetic practices (i.e. art) into official military strategy to the intricate "bio-logical" web of the military-vital complex, it may be argued that the productive forces of Foucauldian biopower continue to frame and reframe the relationship between a "post-industrial" U.S. military and its interface with the public sphere. As evidenced in Chapter 2, one component of this discourse packages war as a kind of natural phenomenon (or, more specifically, a natural disaster). Ultimately, this body of discourse holds important ramifications for the public sphere—for if war is to be considered a "natural" part of everyday life, the public sphere is robbed of some of its deliberative capacity as attention shifts to debates about the virtuosity of *war technologies* rather than about the merits of war itself.

At the same time, the apparent coalescence of biology and engineering has paved the way for a sort of biological technofetishism that manifests itself both in the discursive packaging of

war and in the material innovations designed for the ever-expanding battlefields of the Twenty-First Century. Such a "biomimetic aesthetic" crystallizes several elements implicit in the latest Revolution in Military Affairs. For one, it conveys the general trajectory in which the appendages of the military are developing: toward lifesaving, and indeed, life-simulating ends. That is, these constructions of biomimesis seem to be endemic to a larger phenomenon in which military endeavors dissolve into the backdrop of everyday objects, everyday practices, and everyday life. While many scholars have pointed to the "spectacular" nature of recent military operations (Baudrillard, 1995; Kellner, 1992; Stahl, 2009 a; Virilio, 1989), the drive toward biomimesis suggests a mutation, or subspecies, in the designs of contemporary warfare. At once, biomimesis represents yet another trope through which the military constructs its ethos—much like the spectacle of "Shock and Awe" campaigns—but it also points to a military telos predicated upon diffusion, dissolution, and disappearance into an amalgamation of science, technology, and the surrounding natural world. Fractured and dispersed throughout "every weft and warp" of society, the so-called war machine may thus inscribe its biopolitical power in a variety of ways (Hardt & Negri, 2004).

And so, the goal of this project has been to show how the trope of biomimesis represents a crystallization of several discourses about contemporary warfare. It sets the ideas of Foucault, Hardt and Negri, Virilio, and others in motion in an attempt to capture the rhetorical dynamics of a phenomenon that is often mentioned in war discourse but rarely analyzed in great depth. It also points to the potentially significant implications of what appears to be an increasingly biomimetic brand of warfare. In light of what Hardt and Negri refer to as the military-vital complex, the "biomimetic war machine" would thus appear to be endemic to the transformation in waging war from the defense of the sovereign to securing the existence of a population.

Finally, this project problematizes many of the conceptual divides that often frame war discourse. Chief among these is the boundary between the materiality of objects used in war and the immateriality of the rhetoric constructing public conceptions of contemporary warfare. As I hoped to demonstrate in the previous chapters, there is some slippage on either side of this boundary—as is the case with the public/technical sphere, the form/function, and the natural/ artificial divides that so often characterize discussions of biomimicry in military contexts.

Generally, then, I believe this project accomplishes what it set out to do. Of course, it should not be considered a definitive work on the subject, as there are many opportunities to expand the analyses contained herein: For example, while I mentioned it in the introductory chapter (and later as a brief example in Chapter 3), camouflage is a rich enough text to stand alone as its own subject (within the greater context of biomimicry). Given its historical ties, its symbolic power, and its cultural permutations, one could easily devote an entire project to studying it as a symbol of the biomimetic trends discussed in this project. In fact, I had originally planned to make camouflage a more significant element in this study, but ultimately I decided to forgo its analysis on the grounds that it would likely be a mere reiteration of concepts already highlighted herein. Still, it appears to offer potential as topic for further study and I invite others to investigate its rhetorical components.

Surveillance is another concept related to developments in biomimetic technologies that is ripe for analysis. While I discussed surveillance at length in the introductory chapter, I did so as a way of demonstrating the structural and organizational shifts in military affairs that have occurred over the past century (or so). Yet from what I gather, surveillance is one of the most often cited applications for biomimetic technologies. I argued earlier that this discourse plays into the narrative that these technologies are used strictly for non-lethal operations (frightening

though they may be); however, I could foresee a deeper connection between biomimesis and surveillance in which the two are inextricably woven together in the power relations associated with vision itself. In short, this is another element of biomimesis from which future studies could draw inspiration.

In the same vein, I noticed a number of parallels between biomimetic constructions of war and religious (specifically apocalyptic) rhetoric. For example, it could be argued that portraying warfare as a natural phenomenon invokes the age-old practice of laying claim to God's support in a given conflict. Under the guise of divine intervention, the "collateral damage" and other costs of war can then be written off as results of the "will of God," rather than the results of highly-technologized bombing campaigns initiated by the state. And, of course, the very notion of "life-creating" technologies harkens to imagery found in the Bible's first chapter, Genesis—so a comparative analysis of the Bible and biomimetics might also yield some interesting results for rhetorical scholars.

Also, I would have liked to bring in a few other theorists' ideas into this project. Donna Haraway's ideas about the Cyborg immediately come to mind, as they could probably add to this discussion in more ways than one. I chose not to include her, however, because I thought it would add unnecessary theoretical baggage to a project already entwined with the dense theories of Foucault, Virilio, and Deleuze & Guattari (to name just a few). Similarly, I believe the locus of Baudrillard's work closely parallels some of the ideas expressed in this paper. Again, I chose not to go into great detail about his ideas because I did not want to obfuscate the goals of this project; however, I invite anyone interested in this subject matter to read *Simulation and Simulacra* (and a number of his other works). I would also recommend reading Kellner (2003), Solnit (2005), and Dauphinee & Masters (2005), as they are works that speak directly to some of

the concepts in this project (even though they escaped mention up to this point).

In conclusion, I stress that despite its limitations, I do think this project at least makes inroads toward exploring biomimesis as a prominent rhetorical feature within the greater landscape of war discourse. Moreover, I believe that as scientists continue to develop war technologies modeled after nature—and as warfare is increasingly characterized by natural phenomena—this study will become increasingly relevant for those who wish to study the rhetorical dimensions of future military conflicts. I hope you agree.

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