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Life is War: The Rhetoric of Biomimesis and the Future Military

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In recent years, Western military powers have experimented with both weaponizing existing life forms and designing robotic weapons that mimic existing life forms. These efforts have been accompanied by a discourse of what future warfare will be like. Weapons contractors have released visions of this future on YouTube, television documentaries have popularized scenarios of biowarfare, and films have pushed these narratives to the limits of science fiction. As such, the discourse of "biomimetic warfare" is no longer contained in conversations among military theorists. This essay argues that these rhetorics constitute a redefinition of the boundaries of "war." The essay takes inspiration from Michael Hardt and Antonio Negri's notion of an emerging "military-vital complex," or a military that concerns itself with the biopolitical in Foucault's sense of the word. That is, the vision of the biomimetic military signals a profound public redefinition of war away from localized forms of punishment and destruction and toward a version of war war imminent to the lifeworld and concerned with life's patrol, maintenance, and production.

Keywords: biomimesis, science fiction, war, security state, military-vital complex, biopolitics, media, popular culture, military, rhetoric

Introduction

In a 2008 issue, *Wired* magazine marvels that the military contractor BAE Systems might finally be realizing what had previously been science fiction. Cradled in anticipatory prose is a computer rendering of a mechanical spider, identified as a "notional representation" of a typical unit in a future army of swarming mini-drones.[1] The author instinctively positions the spider among the coordinates of popular culture: "Think of the robots of *Minority Report* rather than the Schwarzeneggers of *Terminator*."[2] Curious readers are invited to click on BAE's video press release, a piece of computer animation that fills out the company's vision of the future. In the video, soldiers deploy a remote-controlled ground car that opens to release a buzzing cloud of flying insectoid drones; robot spiders hop from Baghdad-esque streets up stairs to slip under doors; flying mecha-beetles glide through windows to spy on shrouded insurgents, relaying images to soldiers, who then call in airstrikes.[3] Perhaps spurred by the apparent public interest in such fantasies, the US Air Force Research Laboratories released its own animated video extolling the virtues of MAVs or Micro-Aerial Vehicles, including drone-beetle swarms, flying surveillance pigeon-bots,

and more. The video, produced by defense contractor General Dynamics, paints a future defined by urban combat, the imperative of precision, the safety of virtualized war, and the greater exploitation of "situational awareness" enabled by multi-point surveillance. The developers describe their main strategy, which is to "learn from examples in nature" to achieve a high level of camouflage, efficiency, and real-time response to a changing environment.[4]

These two examples ostensibly represent potential advances in military hardware, but perhaps more tellingly, they signal a burgeoning public discourse about the future of warfare. In such a future, militaries fight on the terrain of the biosphere itself, and victory means harnessing the aesthetics, strategies, and bodies of living systems. In this essay, I argue that this discourse, as it extends from the corners of military theory to the screens of popular culture, is at heart animated by the trope of *biomimetic war* and a larger rhetoric that maps the martial sphere onto the ecological sphere. In so doing, this rhetoric redefines war as consubstantial with life itself. In order to unpack the trope of biomimesis, the current essay proceeds in three sections. The first tracks the discourse of biomimetic war as it has attended recent technical advances. These advances provide the substrate that supports the hypothetical visions the future of warfare that appear in the journals of military theory, the public relations offices of weapons manufacturers, and the newsrooms of the popular press. The second section moves into the realm of popular culture to understand how images of biomimetic war have settled in as a persistent feature of public consciousness, especially in the past decade. Having described the public discourse of biomimetic war, the essay turns to the question of what it means to "imitate nature" in the context of "war." This final section considers the philosophical category of "mimesis" and what it can tell us about this complex interplay of signs. Ultimately the essay argues that the logic of biomimesis expands the definitional boundaries of "war" and thus paves the way for an expanding security state.

The Ecology of Biomimetic Weapons

The discourse of biomimetic war is linked to a long history of martial practices that have utilized "nature" and non-human life forms in the sphere of battle. Sun Zu, author of *The Art of War*, is perhaps the earliest commenter on the subject, issuing the dictum "Know the ground, know the weather; your victory will then be total."[5] By turns, techniques of domestication and saddling of large animals contributed to the rise of empires. The Mongolian empire was made possible by the horse and Genghis Khan's famously swift "arrow riders," the Roman empire made extensive use of the camel, and the "war elephant" saw battle from India to the Hellenic empire to Egypt. Dogs have been a fixture of of military power at least back to the ancient Greeks. During WWII, the US military tested homing pigeons for bomb guidance and considered bats for carrying incendiary devices to be detonated when the animals came to rest under the eaves of city houses. Beginning in the Cold War, the US Navy Marine Mammal Program has made use of trained dolphins and sea lions for underwater mine detection and removal.[6] These examples represent only a few of the historical applications of non-human life for the purpose of warfare. Looking back, one might say that biomi-

metic weapons have been around since time immemorial, and indeed there is no shortage of such claims today.

The trope of biomimetic war, however, has only recently gained real presence in public culture, moving from a marginal position toward the center of the concept we call "war." This discourse emerged at the beginning of the twenty-first century, buoyed by two main technological advances. The first was the harnessing of actual living or ecological systems and subjecting them to integrated cybernetic control systems. The most spectacular of these efforts – and that which has drawn the most public attention – has been a research effort to embed small mammals and insects with such command and control systems. The initial big news came in 2002 when scientists successfully navigated a rat with a remote-control implant wired into the animal's whiskers and brain reward centers. Unveiled shortly after the attacks of September 11, the project expressed its hopes in terms of the imperatives of the War on Terror. Researchers suggested that the "ratbot" might be used to locate and rescue victims trapped under rubble, seek out explosives, or spy on the enemy.[7] The year 2006 saw successful efforts to steer "spy sharks" with a system that appealed to their sense of smell.[8]

Perhaps the largest effort of this kind, however, is a Defense Applied Research Projects Agency (DARPA) program called the Hybrid Insect Micro-Electro-Mechanical Systems (HI -MEMS). As *The Sun* dramatically put it: "An army of wired-up flies, moths and beetles is being created by scientists. They are controlled by a microchip connected to microscopic wires so boffins can send them flying or crawling anywhere."[9] DARPA's HI-MEMS website couches its description in must less sensationalistic terms using familiar metaphors: the program is "aimed at developing technology to provide control over insect locomotion, just as reins are needed for effective control over horse locomotion."[10] The specific goal from the beginning was to build a cyborg insect that could be flown at least 100 meters, land within 5 meters of a target, and stay there.[11]

The actual research, conducted at various sites in the US, has yielded significant breakthroughs. The HI-MEMS program initiated its research in 2007 at four locations. A team at the University of Michigan began working with large rhinoceros beetles; one at the University of California at Berkeley experimented on june beetles; and efforts at MIT and the Boyce Thompson Institute at Cornell University investigated a promising large species called the tobacco hawkmoth.[12] Since its inception, the project has made rapid progress. In 2008, a the project reported to a conference in India on Micro-Air Vehicles that scientists had successfully implanted a control device into a moth during the larval stage.[13] Later, they succeeded in controlling the insect's movements with a microchip interface wired to the nervous system and musculature. Within a few months, engineers succeed in sustaining tethered flight, and eventually they were able to direct controlled flight through radio transmitter.[14] In the future, the project managers hope to power the radio interface – and any number of peripheral devices such as microphones, cameras, GPS guidance systems, chemical sensors, or weapons – by using the insect itself to generate electricity. One potential method involves electrically harvesting flight vibrations, while another proposed to tap into the insect's fat reserves.[15] In January of 2012, scientists were successful in demonstrating that useable amounts of electricity could be harvested from the insect's blood sugar using an en-

zyme conversion process.[16] Such designs will allow the hardware to recharge through normal behavior in the field, theoretically giving the device a "battery life" as long as the life of its host.

Efforts to embed and control living systems have been followed closely by a second class of endeavors that can more properly be called "biomimetic." These are the projects that pattern purely robotic systems after biological models. Much of this research is being conducted at the Wright-Patterson Air Force Base in Dayton, Ohio under the telling acronym, μAVIARI (Micro Air Vehicle Integration and Application Research Institute). The project was launched in late 2010 under an unsettling insignia that looks to be a mechanical dragonfly with sharp talons and a stinging tail. According to an official press release, the program aims to extend the current unmanned aerial vehicle (UAV) capability of the Air Force with a micro air vehicle (MAV) capability. These weapons would range from two feet in wingspan all the way down to the microscopic and mainly be used in urban combat situations.[17] According to its engineers, the project aims to "take the technology that we have and we try to design something that does the same thing as a hummingbird or dragonfly does."[18] In addition to the Air Force, the U.S. Army Research Laboratory established the MAST (Micro Autonomous Systems and Technology) research alliance. As might be expected, the MAST program's focus is more earthly, its emblem consisting of a mechanized scorpion, winged beetle, and spider all resting atop a penny stamped with a 2020 minting date.[19]

On one level, these systems promise an array of novel strategic functions, chief among them the ability to be deployed in a semi-autonomous swarm of individual bots, much like bees or a flock of birds. Such decentralization, the thinking goes, allows for a more predictable, statistical survivability.[20] An 2007 conference presentation by the Air Force Research Lab identified two streams of strategic "game changers." Micro-munitions could prove more selective and precise, able to use network communications to seek out multiple targets. Bio-inspired munitions could have the agility and autonomy to navigate complex urban environments, blending in for "perch and stare" operations or precision targeting. The AFRL elaborated on these goals in a 2011 presentation that described its strategic vision for 2015 as one where drones with flapping wings glide down "urban canyons" on reconnaissance missions, culminating in 2030 when the world promises to vibrate with "ubiquitous swarming sensors and shooters."[21] *Wired*'s Spencer Ackerman zeroes in on the new signs of life in a biomimetic future where "the chirp you hear from the bird perched on the telephone line outside your apartment might be the whir of a robotic hummingbird as its camera adjusts its aperture."[22]

Figure 1: Logos for the Army's MAST program (left) and the Air Force μAVIARY program (right).

Biomimetic War for the Masses

"Forget Noah's arc, welcome to Noah's army."[23]

Just as animals have long been employed in military operations, so have persistent biological metaphors. What we now know as a "drone," for example, is an embedded allusion to a British experiment in remote-control aviation in 1934 called the *Queen Bee*.[24] Surveillant metaphors like the "bug" and the "fly on the wall" were standard in the argot of the Cold War and may be more relevant in the discourse of the War on Terror than ever. In the semantic ecologies of the post-9/11 environment, these metaphors gained a new prevalence and sophistication. Popular news accounts of biomimetic research are quick to play on these metaphors. In 2008, for example, an article in *New Scientist* entitled "The Fly Who Bugged Me," featured a cover image of a swarm of insects stamped with microchips and rigged with camera lenses.[25] This kind of metaphorical slippage, which went well past "taking inspiration from nature" and into the territory of recasting nature itself, gained new life in the era of the new national security state.

The outline of the biomimetic war begins in science magazine accounts like this, but we can further track the trope by following its genealogy in popular culture, particularly in the realm of science fiction. While it is often said that sci-fi imagines the world before it arrives, it just as often waits quietly to be activated and used when the time is right. Such is the case with recent research efforts, specifically the HI-MEMS project, which drew its vision from *Sparrowhawk*, a 1990 novel by Thomas Easton. The novel envisions a world where creatures great and small have been saddled with cybernetic systems in order to be used from everything from civilian air transportation to warfare and espionage. Easton's work was so central to the birth of HI-MEMS that he was invited to present at its inaugural meeting.[26]

Sparrowhawk is only one of many reference points that help to suture real research and development to the popular imagination. Such images have a long history that extends back at least to Ray Bradbury's 1953 novel *Fahrenheit 451*, where he described "The Hound," a mechanical dog used by the police to track down and euthanize criminals on the run. Philip

Dick, in his1964 novel *Lies, Inc.*, depicted a scene where scientists marveled over Housefly #33048, a genetically designed remote controlled surveillance insect. In another pillar of the cyberpunk genre, William Gibson's 1981 short story, *Johnny Mnemonic,* we encounter "Jones," a cyborg dolphin used by the Navy who proved particularly good at decryption tasks but who also nurses a heroin addiction. In 1984, the high-budget film *Runaway*, an echo of *Bladerunner* (1982) starring Tom Selleck and Gene Simmons, paints a world replete with robot servants, some of whom occasionally go rogue (i.e. "runaways") and must be eliminated. Its an iconic scene, the villain played by Simmons is overrun by a swarm of spider-like robots armed with hypodermic needles.

The 1990s took this sparse set of images and began to mold them into a recognizable trope. In 1995, *Johnny Mnemonic* was produced as a feature film and included Jones as an on-screen character. The 1998 revival of the popular 60s British television show, *The Avengers,* played out a scenario where an international terrorist holds the world hostage to a weather-making machine. The film's iconic scene features mechanical killer wasps that chase the heroes' car down a highway. The same year, a Hollywood remake of another 1960s show, *Lost in Space* (1998), reanimated the specter of the spyderbot in its "space spiders," whose exoskeletons are made of "adamantium" and whose mandibles can pierce the metal hull of a spaceship. In *The Matrix* the next year, agents drop a mechanical parasite into the main character's navel that burrows into his nervous system. The franchise as a whole, moreover, painted a world where swarms of "sentinels," giant flying robotic squid, pursue the heroes.

In the post-9/11 years, the trope of biomimesis dug in. Mecha-spiders took on a more earthly cast, beginning in *Minority Report* (2002), where they act in much the same way that BAE Systems envisions its own inventions – crawling drones designed to navigate complex urban landscapes in search of particular human targets. In a scene representing the absolute intrusion of the surveillance state, the film's spiders slip into the main character's bathroom to painfully scan his retinas while he rests in the tub recovering from a black-market eyeball transplant designed to shroud his identity. The spiderbot shows up again in the video game *Call of Duty: Black Ops 2* (2012), this time as a spy drone that the player steers through the halls of a futuristic floating city. In addition to arachnids, weaponized insects made significant appearances during this period. Mechanical butterflies with razor-sharp wings appeared in the first season (2008) of the television sci-fi drama, *Fringe.* Here a powerful corporate group deploys a swarm to deal one of its employees a death by a thousand cuts. The next year, Michael Bay's second installment of the *Transformers* franchise, *Revenge of the Fallen* (2009), introduced the public to the "insecticons," small, robotic, flying insects from space. In one scene, the protagonist, Sam Witwicky, discovers one flying around his room and, fascinated by its resemblance to a real fly, plucks one of its wings.

Figure 2: (from top left) Robotic wasps from The Avengers (1998); Agent Mooch from G-Force (2009); An insecticon from Transformers: Revenge of the Fallen (2009); Ziggy, a spiderbot drone from Call of Duty: Black Ops 2 (2012)

The year 2009 seemed to represent a turning point in the evolution of this imagery. In addition to the arrival of insecticons, this was the year of two significant films: Jerry Bruckheimer's *G-Force* and James Cameron's *Avatar*. While very different from one another, each stood as a symptom that the biomimetic trope had settled into mainstream consciousness. *G-Force*, a children's movie, features a group of hyper-intelligent guinea pigs recruited by the government to conduct top-secret missions. In addition to being themselves cybernettically enhanced, the guinea pigs have at their disposal "Agent Mooch," a remote-control housefly fitted with tiny surveillance cameras. By the time *G-Force* hit the theaters, biomimetic weapons had had at least two years of press. The promoters of *G-Force* took advantage of the public's increasing familiarity with the film's premise and stated quite publicly that they had taken direct inspiration for the film from the HI-MEMS research project.[27] The image of the weaponized biosphere had thus come full circle.

Avatar, the year's biggest blockbuster, served as an allegory of biomimetic war itself. In many ways, the world of *Avatar* is not so different from that envisioned in Easton's *Sparrowhawk*, the inspiration for the HI-MEMS project. Indeed, *Avatar* could be read as a cele-

bration of the same kind of back-to-the-future, neo-primitivistic thought that underwrites the HI-MEMS project and its future projection of a "new kind of war." In the main character's avatar, we encounter the body-as-weapon, developed for the purposes of camouflage, remote-control surveillance, and precision force. The avatar body, in other words, is a sophisticated version of the HI-MEMS beetle. On a larger scale, the film's dramatic arc plays out a contest between a villainous machine-age military and a heroic war apparatus able to commandeer an entire ecosystem through a network of neural interfaces. In addition to the dominant reading of the film that this is a story about abused natural systems fighting back, it is also a vision of a weaponized biosphere. Here this vision appears as an update on the idea of the "Internet of things" to include the remote-control martialing of the web of life.

I offer this quick survey of images from popular culture as a way of tracing a series of reference points in public consciousness. With the possible exceptions of Michael Bay, Jerry Bruckheimer and the *Call of Duty* franchise, all of which have a long and established record of military collaboration, I do not wish to suggest that these images are part of a deliberate campaign to normalize a narrative of biomimetic warfare. They do represent a thickening of such images, however, and in combination with journalistic accounts of actual research endeavors help to project even further into a presumed future. As the war machine literally wires itself into living systems, this set of visual metaphors conceptually wires the war machine to the flesh of the biosphere.

The Biopolitics of Biomimetics

Now that we have had a look at these recent technological advances and some of the discourse that defines them, it is worth unpacking the trope of biomimesis itself to see how it functions rhetorically. By doing so, we encounter a great deal of slippage and ambiguity in what it means to "learn from nature" about how to build more effective weapons and wage more effective wars. Indeed, in many ways it is the nature of imitation and simulation to elide categories and blur the lines between the representation and the represented. The following discussion tracks the dynamics of "mimesis" as engaged by classical philosophy, critical theory, and literary theory. I argue here that a closer look reveals that the discourse serves powerful interpretive and inventive functions that work to redefine the very concept of "war" along biopolitical lines – that is, as a struggle over the production of life systems.

As this discourse migrates from the lab to public culture, it tells a fairly consistent story: that weapons researchers simply observe and mimic the living systems that surround us. In fact, this comes close to the working definition of "biomimesis," even though the term itself mainly appears in the technical literature to describe something between a field and a design approach that applies "natural inspiration" to technical projects.[28] Next to a photo of the "robo-lobster," for example, SIGNAL Magazine, the official publication of the Armed Forces Communications and Electronics Association (AFCEA), describes the endeavor as such: "Strictly speaking, the Wright brothers were among the leading biomimeticists of the past century. Today, engineers are exploring nature to find solutions to some of the military's

toughest challenges."[29] Such a rather matter-of-fact statement, however, contains an implicit theory of how the system of signs intermingles with and informs the new arrangement of hardware. This statement follows something akin to Platonic and Aristotelian versions of mimesis, whose logics flow in one direction, from the Idea of an object to its instantiation in the world to its simulation in art.[30] Here we have a clean division between the original and the copy where the former informs the latter: robo-lobster re-stages the ideal lobster and thus takes advantage all of its mechanical advantages. Such is the mimesis of pure physical functionality most often found in the discourse. The robo-lobster extends this linear conception of mimesis as it exits the lab and slips into the ocean. In doing so, it goes undercover as its original, exacts strategies of camouflage and deception, thereby entering the world as a signifier. This version of mimesis is best elaborated by Roger Caillois in his discussion, for example, of the ways that some moths evade predation by displaying great owl eyes on their wings.[31] In this case, however, the mechanical spider, the "boid," or the cyborg moth, is designed to blend in to escape human detection and perhaps inspire the notion that weaponized eyes "could be anywhere."

Beyond these two functional versions of biomemesis, the story gets more interesting. Research endeavors – as described in trade magazines to TV specials – are driven not simply by "nature" as an innocent category but by a particular version of nature. To inspire a weapons apparatus, in other words, it must be the case that nature is governed by the logic of combat. Here, nature has always been a war, and, far from being an exception, war is a natural state of the world. This fusion functions as the necessary and premise that allows the discourse of biomimetic war to make sense. Even as the description of the robo-lobster above treats the categories of "nature" and "war" as discrete and following a one-way path (the ways of nature inspire the ways of war), it reveals the unspoken assumption that the two represent homologous worlds that can quite easily pass through one another.

Sometimes these underlying premises rise quite obviously to the surface. Consider an episode of *National Geographic Explorer* aired on the MSN network in December of 2002 called "Nature's Secret Weapons," which was a very early glimpse into research efforts to weaponize insect life. As animated techno-bugs zip across the screen, the narration begins:

> A kind of arms race has raged over the earth for millions of years. And from these titanic struggles have emerged superb fighting machines. They are the lords of the air, specialists in all-terrain combat, and armed with uncanny senses to detect and kill. Today, we find ourselves looking to nature's armies for inspiration. For in these troubling times, we face a different kind of threat, from an enemy lurking not just on the battlefield, but in our own backyards. A revolution in technology is changing the way we wage war in the 21st Century, and it's based on nature's secret weapons.[32]

Here, the point of metaphorical contact locates itself in the "backyard," where the ubiquity of the "different kind of threat" meets the ubiquity of "nature." This transference depends on the discourse of "home" and "Homeland Security" already embedded in the War on Ter-

ror.[33]

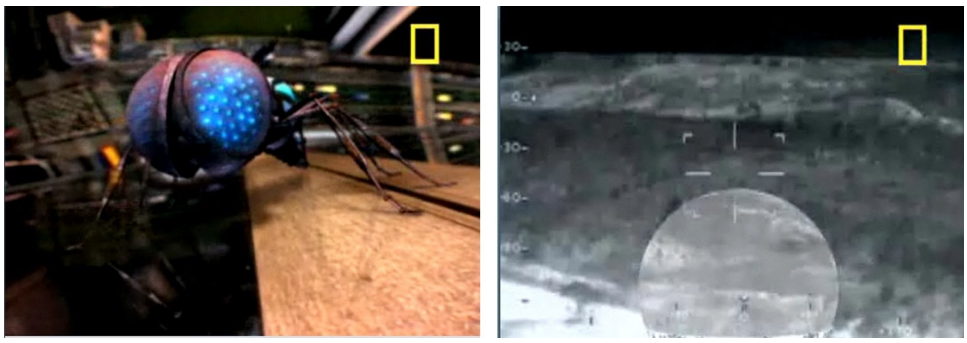

Figure 3: Screenshots from the National Geographic Explorer episode "Nature's Secret Weapons" (2002)

Such a transference is at the heart the version of mimesis described by both Walter Benjamin and Theodor Adorno. For Benjamin, mimesis includes imitation, but it is more properly understood as an act of interpretation. One cannot, in other words, simply copy the original without mediating the meaning of both.[34] Adorno's reading is similar, except that he generally sees mimesis as a moment of interpretive flux within a more static and totalizing rational system.[35] The Benjamin-Adorno perspective lends a richer understanding of how the act of imitation produces a new set of meanings and metaphors. The declaration that this is a "copy of nature" also declares something about the "nature of the copy." As a mirror, mimesis does not simply reproduce. It reflects back and signifies a new set of relationships. In the current case, the trope of biomimetic war arrives as an interpretive shift that maps "nature" and "war" onto a common conceptual grid.

The possibility remains that "biomimetic war" does not simply describe techniques of replication nor even a new way of interpreting the world around us, but rather the invention of a new discourse out of the old. In his discussion of mimesis, Jacques Derrida dispenses entirely with structure of original/copy and suggests instead that the function of mimesis ought to be thought of – like the performance of the mime – as a continual production of signification without the necessity of referring to an underlying original.[36] Taking this more discourse-centered approach, biomimetic war might be thought of not as a redrawing of a constellation (i.e. what happens when language maps actual nature onto actual war) but the production of a new network of meaning that processes this set of already unstable signifiers through the discursive prism of the "War on Terror". For the purposes of this essay, this final account of "mimesis" is most useful as it positions us to ask what new dense networks of meaning have emerged as war goes ecological. This version of mimesis, insofar as it understands discourse as action (rather than a description of action), also helps to orient us toward an appreciation of the primacy of discourse and metaphor as incipient action. The HI-MEMS project, after all, was inspired by Easton's novel rather than "nature" per se.

One way to understand these developments in meaning is through a line of political and

social theory that has reconceived the long development of military power as a changing set of biopolitical relations. Drawing from Michel Foucault and Gilles Deleuze, Michael Hardt and Antonio Negri capture this refinement in their suggestion that the "military-industrial complex" ought to be instead thought of as a "military-vital complex."[37] Increasingly, the stated purpose of war is not to deal out death. Rather, it has reformulated itself as a set of practices for producing and disciplining social formations. The more recent productive notion of "state-building" and the rhetoric of "regime change" are examples of this reorientation of purpose, while the addition of the prefixes "information," "psy," or "cyber" to the language of war indicate shifts toward more subtle battlegrounds, tools and methods. Hardt and Negri's notion of the "military-vital complex" goes further, however, to imply a military apparatus that is not simply an agent of governmental or economic shifts, but an entity that has gone molecular and now seeks to insinuate itself into the flesh of living bodies and systems.

Brian Massumi traces a similar route in his appraisal of the post-9/11 security state. Writing in the wake of Hurricane Katrina, he argues that the discourse of homeland security has been subsumed in a "war-weather continuum" where anything with the "potential to disrupt the rhythms of civilian life is annexed" into the threat matrix, "including climate."[38] The international terrorist described earlier from the film *The Avengers* (1999), who holds the world hostage with the weather-making machine, might be the ideal enemy of this war. Massumi suggests that this discourse is part and parcel of a new security state infrastructure that has erased the lines between natural and "man-made disasters" (President Obama's term). Instead, the threat that permeates the full spectrum of civilian life demands a full-spectrum response. Public discourse about the looming swine flu is a case in point. For Massumi, this discourse fused concerns about biological warfare with commerce, animal husbandry, hygiene practices, and disease vectors.[39] The sudden veneration of "first responders," moreover, is part of a new discourse that conceives of the threat as a field of diffuse, indiscriminate, and ultimately apolitical factors primed to suddenly align and irrupt in an unforeseeable accident.[40] Massumi's point, like that of Hardt and Negri's, is that war has become a biopolitical event, an opportunity for the security state to preemptively intervene in the production of life systems.

While Massumi's observations about the collapse of the nature/culture divide are right on target, he focuses more on institutional practices than signification. He assumes that the new biopolitical apparatus has reorganized itself as a kind of immuno-response to an existent threat and that the new threat discourse is only symptomatic of these structural shifts.[42] Here I want to suggest instead that the specter of the militarized biosphere is part of an eminently discursive process of redefining the province of war. The color-coded terror threat meter, for example, acts as a metaphorical bridge to redefine the notion of "terrorism" as something akin to a hurricane or tornado, thus positioning the "War on Terror" as an emergency response to a natural cataclysm. The specter of biological weapons, featured as a central metonym of war, calls forth a struggle assumed to operate on an ecological level. The trope of biomimetic weaponry works similarly, redefining the province of military power and fulcrum on which "war" will likely turn. As we have seen, such a vision has driven certain re-

search advances. These advances have, in turn, become objects of public fascination, themselves folded into the narrative as forecasting signifiers of future warfare and its brave new ecologies.

Conclusion: The Twin Logics of the Security State

This essay endeavored to map the contours of a new discourse of biomimetic war as it has been inflected in our media environment. This war discourse is particular in that, rather than demonizing an enemy or lauding the troops, it projects into the future to paint a picture of "what war will be like." Its posture is for the most part dispassionately predictive, but in its definitions, metaphors, and images, this discourse presumes an entire set of values regarding the natural role of the military. The essay proceeded in three parts. The first looked at the research endeavors themselves and how the military and military contractors have chosen to represent this research to the world. In the project names and public relations efforts, we see the war of the future taking shape. The second section followed the trope of biomimesis as it has appeared in popular culture, both in non-fictional press accounts and sci-fi treatments. This survey suggests that, even though the theme has a long history, biomimesis as a trope of war appears to have enjoyed increased exposure in the 1990s and established itself permanently in the popular psyche in the 2000s. The final section broached theories for making sense of this new symbolic landscape, examining how the history of the philosophical theme of "mimesis" informs what it might mean to "imitate nature," especially as it signals an abrupt shift toward biopolitical metaphors of "war."

I want to suggest further that the trope of biomimetic war is a recent and fuller expression of two main logics that have been a part of the larger War on Terror narrative since its articulation after September 11, 2001. The first logic is temporal: war has gone from a state of exception to a state of permanence. The conflict can never be completely resolved, despite the professed resolve of certain leaders, because it now appears as a natural condition. The unresolvability of this condition is dependent on the subtheme that the war is a response to evil that arises *sui generis* and exists for its own sake, much like, for instance, the swine flu. Casting the War on Terror as such a struggle obscures the political conditions that motivate violence, which is one reason why, as James Arnt Aune suggests, the "argument from evil" is "inherently corrosive to democratic politics."[42] Defined in this way, The War on Terror cannot be solved politically and must exist instead as a perpetual and taken-for-granted natural state. The second main logic of the War on Terror is spacial: war tends toward the ubiquitous as public discourse progressively annihilates boundaries between homefront and battlefield. This premise holds that terrorism could occur anywhere and repurpose anything as a weapon. To combat the looming specter, the military machine must itself strive toward ubiquity, a state of control that Hardt and Negri suggest marks postmodernity, where power is "ever more 'democratic'" and molecular, distributed "throughout the brains and bodies of the citizens."[43] These two logics – perpetuity and ubiquity – form the discursive foundation that allows the trope of biomimetic war to make sense. As the concept of "war" enters the finer

capillaries of everyday life - "embedded," as it were, like a silicon chip on the back of a living animal - it thereby works to justify an invasive security apparatus. A critical step in containing the security state, therefore, is recognizing how these powerful metaphors work.

Notes

1. BAE Systems-Led Team to Develop Miniature Robots for Military Use," News Release, (April 28, 2008), http://baesystems.com/Newsroom/NewsReleases/autoGen_10832814523.html.
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34. The early Benjamin penned two essays on the subject that appear, apropos, to be versions of one another: "On the Mimetic Faculty" and "Doctrine of the Similar." Benjamin argues that, among animals, humans are particularly wired to see similarity in the world. As such, Benjamin's conception of mimesis includes imitation but also extends to interpretation. His analysis, as it spans from primitive to modern humanity, suggests that the world of magic (represented by astrology and other kinds of divination) has been displaced by the increasingly "non-sensuous" correspondences of spoken and then written language. This does not mean that the mimetic faculty has been lost, however. Benjamin's eventual point is that mimesis still lurks in such things as onomatopoeia, the heiroglyphic residue of print, or the will to read the unconscious in an individual's handwriting. In Benjamin, we get a version of mimesis that threatens the clean divide established by Plato between the original and the copy. Interpretation is the key term here as it stands for the ways that language is never free of homology. Walter Benjamin, "Doctrine of the Similar (1933)," trans. Knut Tarnowski, *New German Critique*, no. 17 (Spring 1979): 65–71; Walter Benjamin and Peter Demetz, "On the Mimetic Faculty," in *Reflections: Essays, Aphorisms, Autobiographical Writing* (New York: Schocken Books, 1986), 333–36.
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36. In his reading of Kant entitled "Economimesis," Derrida takes issue with the twin notions dominant in Western enlightenment thought that mimesis is either a property of nature representing itself or that mimesis is a human artistic act analogous to divine creation. Jacques Derrida, "Economimesis," trans. R. Klein, *Diacritics* 11, no. 2 (Summer 1981): 2–25. In "The Double Session," printed in *Dissemination*, Derrida notes again that mimesis has traditionally had a dual meaning: that it either refers to nature presenting itself (*physus*) or the revealing of the thing itself through imitation (*adequatio*). Jacques Derrida, *Dissemination*, trans. Barbara Johnson (Chicago: University of Chicago Press, 1981), 193; William Schweiker, "Beyond Imitation: Mimetic Praxis in Gadamer, Ricoeur, and Derrida," *The Journal of Religion* 68, no. 1 (1988): 21–38.
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40. Ibid., 163.
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its existence). Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (Minneapolis: University of Minnesota Press, 1987), 86.

42. James Arnt Aune, "The Argument from Evil in the Rhetoric of Reaction," *Rhetoric & Public Affairs* 6, no. 3 (2003): 518.
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