Chapter 9

The Hydra and the Leviathan

Unmanned Maritime Vehicles and the Militarized Seaspace

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> God, having set forth the great power of Leviathan, called him king of the proud. "There is nothing," saith he, "on earth to be compared with him. He is made so as not to be afraid. He seeth every high thing below him; and is king of all the children of pride."
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> —Thomas Hobbes, 1982 [1651], 362.

> [T]he boat is a floating piece of space, a place without a place, that exists by itself, that is closed in on itself and at the same time is given over to the infinity of the sea.
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> —Michel Foucault, 1986, 27.

For Thomas Hobbes, the Leviathan was a fitting metaphor for sovereignty not because it was monstrous or came from the sea, but because it derived from the Hebrew word *liwyāthān,* meaning to join or twine. Hobbes insisted that the primary virtue of the sovereign body lay in its power of unification, its ability to amplify the capacities of the people and thereby constitute a commonwealth. Without a sovereign to rule them, Hobbes declared, humans would remain brutish, engaged in a war of "every one against every one" (Hobbes 1982, 80). Hobbes's Leviathan therefore named a people unified, saved from their monstrous selves by the sovereign.

While Hobbes's sovereign power invoked the people as the subject of governance, Michel Foucault's biopolitics drew attention to populations (1990, 1995). As Foucault described, institutions of medicine and learning, technologies of security and social life, and management of physical bodies reconfigured techniques of governance throughout the nineteenth and twentieth centuries. Alongside industrial and postindustrial capitalism, disciplinary and biopower diffused

political power across the social body. While the techniques of sovereign governance characterized by Hobbes's Leviathan persist in many aspects of today's nation states, the many-headed Hydra of Greek mythology seems the more apt oceanic metaphor for the recently ascendant forms of political governance that Foucault described.

The Leviathan and Hydra are not much more than mythic metaphors in these political theories. Hobbes did not take the actual oceans very seriously, unashamedly grounding his political treatise in the lands of Europe. Foucault gave the oceans slightly more thought. In his essay "Of Other Spaces" (1986), the seas exemplified his concept of "heterotopia," or "counter-sites," where alternatives to prevailing hegemonic norms were possible (Saldanha 2008). While he would later abandon the concept, Foucault famously referred to seafaring ship as the "heterotopia par excellence" (1986, 27). Operating outside of the normative social and legal structures that govern landed society, the ship was a space "unto itself" that was "given over to the infinity of the sea" (Foucault 1986, 27).

Just as the Hydra and Leviathan signal very different modes of governance and different visions of the commonwealth, Foucault's essay envisions the sea and its ships as radically other to the workings of government on land. Within Foucault's writings, however, the seas themselves remain abstracted, primarily serving as a space unburdened by the matters and histories of territory, where one might imagine alternative political formulations. What might happen to these considerations of sovereignty and the commonwealth when we take the three-dimensional space of the ocean more seriously?

In what follows, I consider this question by following how the US Department of Defense (DoD) is developing machinic technologies—notably endowed with the moniker Hydra—that would enable a more distributed geopolitical security apparatus at sea. I ultimately

trouble the claims that ocean and land, Hydra and Leviathan, are oppositional in governance, finding instead that they are interactive and co-constitutive—materially, legally, and symbolically. This, I suggest, raises questions about the nature of sovereignty and the future of what Hobbes referred to as the commonwealth.

Entangled Seas, Entangled Futures

The mission of the Defense Advanced Research Projects Agency (DARPA), the U. S. Department of Defense's (DoD's) research and development arm is to create "breakthrough technologies for national security."[1] But the Agency's role is perhaps best captured by the epigraph on its "About" web page, a quote by composer Franz Liszt that reveals DARPA's true purpose is to "cast a javelin into the infinite spaces of the future." As the placement of Liszt's quote suggests, DARPA is a national defense agency unlike any other: rather than predicting and responding to an imagined political landscape to come, DARPA seeks to chart a course into the "infinite spaces of the future." By seeding science and innovation, they also direct them and, thereby, hope to give our collective future definition through scientific and technological enhancement.[2]

With what kinds of technologies is DARPA hoping to shape the "spaces of the future"? What futures—indeed, what worlds—does it seek to build for our collective inhabitation? The media and academy have lavished attention on the ways that aerial drone technology has reshaped warfare as well as geopolitical borders (Shaw and Akhtar 2012; Chamayou 2015; Shaw 2016; Kindervater 2017). But new programs are also expanding into the spaces on, below, and above the ocean's surface. Under the moniker of the Hydra program, DARPA is working to build unmanned autonomous vehicles (UAVs) capable of performing surveillance and reconnaissance,

detonating underwater mines, and delivering various payloads in international waters. Launched in 2013, Hydra is one of many research and development programs in unmanned maritime vehicle (UMV) technologies. It is meant to ameliorate the core problem faced by the US Navy: the seeming imperative to "cover vast regions of interest around the globe" while fewer forces and budget restrictions shrink the size of the fleet overall (DARPA, n.d.[a]). DARPA's Hydra program envisions a floating, unmanned infrastructure of modular, interchangeable parts. In the words of the DARPA project description, Hydra would enable "faster, scalable and more cost-effective deployment of assets wherever needed" (DARPA, n.d.[a]). In what follows, I chart a transition in sovereign imaginaries of and on the sea. Rather than emanating from territorial land, I find that sovereign power increasingly attaches to technological objects and the algorithms that operate them.

Throughout this chapter, I analyze DARPA program calls and descriptions as well as naval planning documents and technoscientific publications germane to US naval strategies. The documents that imagine those technologies utilize and challenge existing ocean legalities and visions of sovereignty. Contrasting DARPA's Hydra project with conventional understandings of sovereign power and the commonwealth, I consider how the rise of machinic warfare is reshaping ocean space and statecraft.

DARPA seeks to bring future visions to life through the creation of UMV technologies. These technologies are part of efforts to "secure the volume" (Elden 2013a) of underwater space and extend the dominance of the US military across and among the continents. Yet, military technologies and the forms of spatial dominance to which they strive are fragile compositions at sea (as well as elsewhere). Following Philip Steinberg and Kimberley Peters's call to consider the "turbulent materialities" of the ocean (2015, 247), this chapter thinks with the militarized sea

as a three-dimensional space. But the material processes of the militarized ocean also connect with turbulent materialities and imaginaries well beyond the seas. DARPA's ocean technologies take shape in laboratories and research sites in connection with the "underlying churn" (Peters 2015, 248; also see introduction to this volume) of military histories, fears of the deep, and transnational legal infrastructures, none of which are stable. Far from infinite, therefore, these militarized "spaces of the future" are tightly tied to matters, technologies, and legal frameworks created at temporal and spatial distance.

Paying attention to this turbulent churn of imaginaries, materialities, and legislative infrastructures raises important questions about who and what is brought together into a common world by DARPA's innovations. The rise of autonomous technologies is a process that seems to decenter the human in the making of machines and engender a security apparatus that appears to be predominantly composed of nonhuman actions (Shaw 2016). But machinic technologies do not remove human actions from geopolitical engagements. Rather, they distance the work of humans from the immediacy of battle to civilian sites of anticipatory innovation. And though the military's future imaginaries and technologies are far from a fait accompli, they play a significant role in reconstituting sovereignty and the commonwealth by silently migrating ocean warfare not only into technological devices, but into the laboratories that make them (see also Irus Braverman, this volume).

Reshaping Warfare, Re-Engaging the Seas

Since the conclusion of the Cold War, the US military has been unmatched in size and strength. Even as the number of military personnel is almost half of what it was in 1955, the US military's

global dominance remains unrivaled. To maintain strength in capacity, the US has turned to drones and other UAVs to act as "force multipliers" on the labor of the military workforce (US Department of the Navy 2004, 13). By replacing human life with the machines, the DoD aspires to "maintain global dominance by doing far more with less" (David Vine, quoted in Shaw 2016, 38).

As many writing on aerial drone technology have shown, advanced machinery like UMVs does not merely intensify existing military strategies; it transforms them (Gregory 2011; Chamayou 2015; Shaw 2016; Kindervater 2017). Displacing the battlefield as the site of military engagement, the machinery of the drone has engendered what Derek Gregory has called an "everywhere war" (2011). If battlefields were once geographically distinct, Gregory argues, their borders have now been eroded. Effecting a particular bio- and geopolitical calculus, endangerment and risk in the drone's surgical strike are felt only on one side of this everywhere war. The executers of drone strikes sit removed, safely distanced from the action, while bombs are dropped in Pakistan, Yemen, Iraq, Afghanistan, and Somalia. There, the distinction between civilian and enemy combatant or militant is made more or less indistinct. There, one's life is constantly at risk. For this reason, Grégoire Chamayou refers to this warscape of aerial drones not as an everywhere war, but as a planetary "hunting ground" (2015, 52).[3]

Just as aerial drones shifted the logics and spaces of war, seagoing autonomous vehicles are changing military engagement at sea. The future ocean at work in DARPA's designs is not one of climate change and rising sea levels, resource contraction or expansion in the form of subsurface minerals or fisheries (see Alison Reiser; Zsofia Korosy, this volume), or dramatic losses in biodiversity and dying coral reefs (see Irus Braverman, this volume). Instead, the oceans are one of several milieus of military engagement, where security and warfighting

capacities might be enhanced by technological innovation. At play in military imaginaries are multiple marine epistemologies that can ostensibly anticipate future actions (Anderson 2010) as well as the reemergence of remembered threats.

DARPA's Hydra program developed in response to the US Navy's master plan for research into unmanned undersea vehicles (UUVs) released in 2004. The eighty-page document reveals the Navy's strategic imaginary. The cornerstone of that imaginary is the production of "network-centric warfare," what the Navy refers to as a Force Net (US Department of the Navy 2004). The Force Net and other elements of the DoD's marine spatial imaginary reflect that of its aerial and territorial counterparts and ensure access to land. As the Navy's UUV 2004 master plan establishes, autonomous technologies are designed to ensure that "the Navy be able to achieve and maintain access to all the world's littoral at the times and places of its choosing" (US Department of the Navy 2004, 31).

The Office of Naval Research (ONR), often in conjunction with DARPA, has been experimenting with robotic technologies for decades. Throughout the 1990s and early 2000s, DARPA funded the development of an assortment of small-scale UUVs, many of which operate on principles of biomimicry (Johnson 2015). Robotic lobsters, clams, tuna, and crabs have marched (or swum) forth from DARPA's coffers to demonstrate the potentials of robotics in military security. Although many of these technologies never advanced past prototype, new UUV technologies are less experimental and more real-world ready. DARPA is building on those earlier projects to reimagine the potential of autonomous robotic engagement within a wider ocean space and amid a broader range of war-fighting capacities.

DARPA's UUVs operate according to a somewhat different calculus of life, death, and geopolitical risk than do aerial drones. For the US naval and marine forces, securing the spaces

of the sea with our terrestrial-bound human bodies has long been a challenge. Basic human needs for air, freshwater, food, and space have always limited movement across the seas. Warships, aircraft carriers, and submarines—until recently technologies necessary to sustain life and warfare on or beneath the waves—represent some of the most capital-intensive infrastructure used by the US military. Traditional warships, for example, cost upward of seven hundred thousand US dollars per day to operate (Merchant 2015). Such a fleet is not only costly, but ponderous: aircraft carriers and warships are incompatible with an ongoing, globally distributed war that calls for "just in time" capabilities. Replacing peopled warships with autonomous systems could save millions: one report estimates that autonomous systems could operate at only fifteen to twenty thousand dollars per day.

DARPA's Hydra is imagined as a network of machinic agents capable of patrolling the waters without necessary input from a central command. The nine-headed serpent of Greek mythology with the powers of regeneration serves as its emblem. Hydra would create a coordinated modular system of networked autonomous vehicles and weapons capable of engaging sea, air, and land. As the original Agency announcement on the program explained, Hydra would provide "a novel delivery mechanism for insertion of unmanned air and underwater vehicles into operational environments" (DARPA, n.d.[a]). If successful, the program would result in the deployment of a fungible container vehicle, referred to as the mothership, capable of coordinating smaller UMV and UAV operations in sea and air space. Several related projects are also part of the Hydra mission, including DARPA's Tactically Exploited Reconnaissance Node (TERN) program and the Raytheon-produced, six-pound Switchblade drone that can morph from an underwater submersible to a workable aerial drone capable of taking flight from the surface of the sea (figure 9.1).

<Figure 9.1 here>

If DARPA's javelin into the future is reshaping the space of naval battlefield, it is also shifting governance and broader geopolitical strategies. In doing so, DARPA utilizes and responds to existing ocean legalities as well as the turbulent movement of the seas. In DARPA's strategic documents, the oceans appear on two registers. In the first, the high seas serve as a *surface* of engagement. There, UMV technologies extend not only the capacities of human warfighters, but also sovereign control over global space. Extended via seacrafts networked across the earth, the imagined future US naval fleet will utilize the legal status of the high seas to expand its access to distant regions. In the second, the DoD builds strategies and technological futures around the materials *within* the sea. Here, the sea appears as a three-dimensional or volumetric space (Elden 2013a), "churning," as Steinberg and Peters have written, with material and temporal dynamics that must be abided. In the two sections that follow, I show how the Hydra program and the DoD's wider efforts to produce a future of autonomous warfare are hitched to these two visions of the sea.

Seacrafts and Statecrafts: Buoying Empire on the Surface

United States territory hosts no foreign armies, yet it operates bases in almost eight hundred locations. These bases produce a network of US military forces that span the globe, effecting an empire of "lily-pads" from which the US can launch military operations on a just-in-time basis (Vine 2015a). As David Vine has noted (2015a), maintaining such a network is resource heavy and fraught with tension. International base infrastructure requires constant diplomatic negotiation with host nations and often results in international pressures as well as anti-American

sentiment in host countries. In some cases, US bases are housed within the territories of dictatorial and autocratic regimes. In others, the governmental arrangements that permit US bases on foreign soil are ludicrously complex and decidedly undemocratic. In Thailand, for example, private contractors—and not the Thai state—negotiated the creation of Utapao Naval Air Base south of Bangkok (Vine 2015b). With the UMVs of the Hydra program, the DoD hopes to turn the international status of the high seas into a tactical opportunity capable of circumventing these issues.

The United Nations Convention on the Law of the Sea (UNCLOS)—which is in effect, although the US has never ratified it—divides the ocean into seven zones. Of them, five are subject to the jurisdiction of coastal nation states to varying degrees: internal waters, the territorial sea, contiguous zones, exclusive economic zones (EEZs), and continental shelves. As noted elsewhere in this volume, coastal states have full sovereign control over their territorial seas, which extend twelve miles from the coastline and include everything from the air above the water to the seabed and subsoil (UNCLOS 1982). Here, "ships of all states," including submarines, warships, and (presumably) UMVs, maintain the "right of innocent passage." That is, they may traverse the surface of the sea, their flag in view, in ways that are not "prejudicial to the peace, good order or security of the coastal State" (UNCLOS 1982, Article 31). Behaviors considered "prejudicial" obviously include the threat of force, exercise of weapons, or launching of aircraft. But UNCLOS also prohibits the collection of information, the carrying out of research, or any activity that would jeopardize the environment of the coastal state (UNCLOS 1982; see also Jessica Lehman, this volume).

The final two zones, the high seas and the deep seabed, are not subject to the jurisdiction of any one state. These vast expanses of ocean space remain governed as a common in

accordance with Hugo Grotius's principle of *mare labarum* (see Alison Reiser, this volume). There, all ships—whether fishing boats, warships, or UMVs—"have complete immunity from the jurisdiction of any State other than the flag State" (UNCLOS 1982, Article 59). Accordingly, UMVs can operate a range of missions, from research to military exercises, without the express permission of other states (Showalter and Manley 2009). The hope is that, by using UMV technologies to fan out across the high sea, a combination of UMVs and aerial drone technologies will allow the US Navy access to the world's coasts (at least, at a distance of only two hundred miles), where they might respond to threats as they emerge. That is, they hope to create the conditions for constant and continuous surveillance of the shorelines of every continent.

Envisioned through the Hydra program, therefore, is not only a global empire of military power, but also a decoupling of warfare and sovereign territory. In this military imaginary, the production of a networked, floating infrastructure of autonomous components would unground the Navy's and air force's warfighting capacities: territorial bases and resource-intensive aircraft carriers would no longer be needed as operation launch sites for weapons or drones. Hydra would network the globe into a system of floating, mobile bases capable of rapid response. By utilizing the status of the high seas, the US dreams of breaking the links between military might and diplomacy.

Ian Shaw has written that aerial drone strikes show how the "reach of state power is clearly not tied to the fixed territory of the state," but, rather, is "mobile and global" (2016, 14). The rise of UMVs take this even further, to demonstrate how state power also operates on the back of material objects that float through the fluid substrate of the sea and the broad legal infrastructure that is UNCLOS. Requiring neither land nor diplomatic agreements with other nations states, UMV programs would, contra Shaw, not render US geopolitical reach "boundless"

(Shaw 2016, 146). They would instead affix US military force to material technologies rather than land masses. This is a machinic, mobile extension of the surface logics of landed territory mapped over the legal status of the high seas. Here, sovereignty and geopolitical power are made *on top of* technological objects and the algorithms that operate them. By ungrounding military power and loosening the constraints of sovereign territory, land is not rendered irrelevant but is redistributed to the sea through these floating objects of military significance. The imagined future built by UMV technologies thus promises to shift geopolitical space and retie the knots between land and sovereignty on the back of mobile technologies.

Turbulent Oceans, Anticipatory Threats

The strategic and tactical advantage of UMV technologies goes beyond the extension of sovereignty onto adrift technological objects. Through machinic innovation, the DoD also exemplifies Stuart Elden's volumetric geopolitics (2013a), showing how the nation state mobilizes political power below the surface as well as on it. The Navy's UMV master plan and DARPA's program documents envision sea depths as a stratum of threats—both known and potentially emergent. Here, we find that the oceans are, indeed, a "hunting ground." But unlike sites of engagement in air and over land, the objects of the hunt are more diverse and predominantly nonhuman. Other autonomous seacrafts, submarines, missiles, and underwater mines—recently laid and long buried—are the DoD's primary concerns.

Consider, for example, one of DARPA's most successful autonomous marine programs to date: the Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUV) program. In 2016, ACTUV unveiled *Sea Hunter*, a ship currently undergoing field testing. While it glides

across the surface of the sea "under sparse remote supervisory control," it monitors what lies beneath. *Sea Hunter* was designed to detect hard-to-sense diesel electric powered subs by performing unmanned missions spanning "thousands of kilometers of range and months of endurance" (DARPA, n.d.[b**]**). Brought to fruition by the national security and healthcare company Leidos, the *Sea Hunter* is reportedly capable of autonomously complying with "maritime laws and conventions for safe navigation" as well as interacting with "an intelligent adversary" (DARPA n.d.[b]).

In the context of ACTUV and other UMV development programs, the oceans and seas appear as "vast sanctuaries" for potentially emergent threats, including stealth submarines and nuclear missiles (Holmes 2016: 228). More than a container in which action might occur, the seas appear as a milieu within which the unexpected might at any time emerge. Here, the deep sea appears as what it has long been: a site where fears of the monstrous lurk. Within both near-term and long-range naval strategy, the sea therefore becomes an arena for what Ben Anderson has referred to as anticipatory actions (Anderson 2010). This anticipatory posturing toward the future is not abstract; futures are produced through engagement with logics of "precaution, preemption and preparedness" (Anderson 2010, 792). Even as the US naval fleet is by far the most well-heeled and technologically advanced in the world, the DoD approaches the sea through the lens of future catastrophes, some imminent and others improbable. As several looming threats build—for example, as North Korea brashly develops nuclear capacities, China modernizes its naval fleet and Russia postures aggressively toward Arctic oil reserves—the threat of traditional and nuclear war looms ever larger in the DoD's imaginary (Pellerin 2017; Gramer 2017; O'Rourke 2018). In the short term, the DoD has planned to buttress existing naval strategies by building warships, equipping aircraft carriers, and developing longer-range land

missiles. The long-range strategy, however, imagines a network of autonomous vehicles capable of near-constant surveillance and rapid response.

Developing strategies for preemption and preparedness at sea requires knowing what lies beneath the surface to effectively maneuver within it: how to communicate, navigate, lay cable on the ocean floor, and detect and neutralize threats. By doing so, the Navy reimagines the sea as a space for "operational battlespace preparation" (US Department of the Navy 2004, xx). Through this lens, the sea becomes subject to particular epistemologies. To operationalize the oceans, DARPA and the US Navy must first abide the unique qualities of the sea. As Steinberg and Peters have written, the material conditions of the oceans differ dramatically from the conditions of the air (2015). Ocean water as a medium is exceedingly difficult to penetrate, sense, and know; its very nature threatens to limit or thwart military operations at every turn. Large bodies of water diffuse, refract, and attenuate sound and light. Indeed, electromagnetic emissions of all types are subject to fluid dynamics.

Steinberg and Peters's notion of "turbulent materiality" (Steinberg and Peters 2015, 247) is particularly salient here: changes in temperature, pressure, and salinity bend light and sound, playing tricks on eyes as well as sonar operators (Holmes 2016). Threats can hide in the three-dimensional space of the water, above and below, "disguising their presence even from nearby foes" (Holmes 2016, 228). The *Sea Hunter* and other UMV technologies must therefore do more than merely sense what lurks in the depths of the ocean: they also require the capacity to sense *through* the material substrate of the sea.

For this reason, many of the Navy's existing and envisioned UMVs are meant to facilitate the production of knowledge of what lies beneath and above the surface, to render transparent the ocean's contents and physical conditions so that movement through that substrate can be

ensured. To produce such knowledge, UMVs are required to perform feats that are impossible for the human body. Like the research vessels described by Jessica Lehman and Irus Braverman (this volume), the military is producing UMVs capable of the deep-sea and long-range missions necessary to map the seafloor and gather data on the physical components of the sea: bathymetry, water column characterization, salinity profiles, measures of bioluminescence as well as chemical, biological, and nuclear weapons detection and tracking. This information can be gathered and used in "near real-time for tactical support" or archived and "provided in rapid-turnaround mode for operational battle space preparation" (US Department of the Navy 2004, 39).

The DoD engages in a world made murky by more than its material turbulence. The history of maritime warfare has given life to a class of weapons that seem to continually resurface even after they fade from memory. Perhaps surprisingly, today's Navy considers traditional underwater mines and underwater improvised explosive devices (UIEDs) the "quintessential naval asymmetric threat" (US Department of the Navy 2004, 31). Mine warfare resurfaced after the conclusion of the Cold War as one of the "most problematic of the missions" faced by the US Navy (US Department of the Navy 2004, 24). Their proliferation, international availability, and ease of employment make them a key component of what the DoD often refers to as a "poor man's army" (Truver 2011). Formal mine technologies are produced today by thirty countries and exported by a third of those (Truver 2011). UIEDs are easy to build even as a do-it-yourself technology. For aging arsenals, retrofitting old mines with updated components is highly effective as well as cost-saving. In some cases, such updates are not necessary: in 1988, a US tanker in the Arabian Gulf sustained ninety-six million dollars in damage after striking a

mine that was designed during World War I. The oceans and their troubled histories mean that even past threats may reemerge at any time (see also Astrida Neimanis, this volume).

Mine countermeasures (MCM) have been a cornerstone of the development of UMV technologies. Calls for UMV development often reference the history of mine warfare. Strategists often recall when, in 1991, Iraqi forces sowed thirteen hundred mines in the Arabian Gulf during the Desert Storm conflict. Or when North Koreans embedded over three thousand mines off their eastern coast to deter an attack on the city of Wonsan in 1950. Rear Adm. Allen E. Smith, commander of that thwarted attack, had this to say about the power of mine warfare in the twentieth century: "We have lost control of the seas to a nation without a navy, using pre-World War I weapons, laid by vessels that were utilized at the time of the birth of Christ" (quoted in Truver 2011, 31). And while we often think of underwater mines as a line of defense used to prevent enemy invasion, they are also an effective tool for encircling one's enemy. In 1945, more than twelve thousand US mines placed along Japanese shipping routes damaged approximately 670 Japanese ships to cut off supply lines as part of what was referred to as Operation Starvation.

Underwater mines may be considered the first autonomous underwater technology, one of the earliest means of taking humans out of the loop in the deployment of weapons. While scientists and engineers attempt to develop the capacities for communication, surveillance, and navigation in the undersea environment, these early forms of unmanned weaponry require only the capacity to persist as potential explosives. Indeed, nearly every military document and white paper on mines begins with the same refrain: "a mine is a terrible thing that waits" (Truver 2014; LaGrone 2014a, 2014b). These weapons are therefore both a material and immaterial threat: an imagined minefield can be just as effective in deterring enemy forces as the laying of actual mines (US Department of the Navy 2004).

By building networked UMV technologies with the capability of reliably sensing the three-dimensional, turbulent materiality of the seas, DARPA promises to build the capacity to eliminate both real and feared threats. In doing so, the Agency seeks to eradicate the very possibility for ignorance in what lies beneath. But what is rendered transparent by military science and imaginary is heavily constrained—there are no ecologies or forms of life here. By imagining and enhancing the capacity to know the seas' movements and sense what lurks beneath the waves, the US military only seeks to render the ocean operational for anticipatory action. Knowledge of the seas is shaped accordingly, as it is oriented to threats, preemption, and geopolitical preparedness.

Mechanizing Sea Monsters, Reshaping the Commonwealth

The US military's efforts to make the ocean an operational space are consistent with their decades-long desires to achieve full-spectrum dominance on the battlefield. The dream of full-spectrum dominance has long spurred military innovation, but it has far from materialized. As the previous sections have shown, DARPA's "javelin" does not encounter the "infinite" space of either sea or future; it is deeply entangled with multiple pasts and legal infrastructures that constrain it. While the US Navy may never achieve its visions of geopolitical dominance at sea, in this final section I return to questions of the relationship between governance and Hobbes's notion of the commonwealth. I consider how the DoDs' dreams prefigure changes in how our human lives are composed with and in relation to the sea.

Just as manufacturing has replaced human labor with machines, the DoD technologies promise to eliminate human life—not from the ranks of enemy forces, but from the US's own

front lines of warfighting. Before the end of the Cold War, spatial configurations of the battlefield largely remained rooted in territoriality and the disciplined behaviors of bodies that dealt in and were made subject to death on the battlefield (Elden 2013b; Wilcox 2015). Conscription and the draft sourced bodies from a general, if primarily underclass, population. But as Ian Shaw has noted, the biopolitical, technologically enabled state engages in warfare differently: life and the cost of military labor are no longer as cheaply spent as they once were (Shaw 2016).[4] Mobilizing human bodies and the materials necessary to sustain them is economically and politically costly.

The advancement of machinic technologies also means that humans are no longer required to do inhuman things, at least not in the flesh. Or, as Grégoire Chamayou has put it, "the sacrifice of vile bodies [is] no longer necessary" to advance the security aims of the militarized state (2015, 22). The institution of this new regime of warfare has not constituted a break from past forms of military engagements but has taken shape gradually as technologies and advanced weaponry have made it ever easier to distance bodies from battlefields. While geopolitical strategies and military conflicts have long been made in advance of battle at sites of weapons manufacturing, today the innovations of war and machinic engineering are eclipsing the soldier, the medic, and the logistics officer, all of whom orchestrate on-the-ground invasions. This gradual distancing continues as the seas appear in the DoD's strategic visioning to be evacuated of human and other life forms. Machinery and physical matter take over as the primary elements of concern in the operational environment. This seems a very different sovereignty and corresponding commonwealth than those that Hobbes imagined. Whereas in his vision nonhumans and forces of production were relegated to the background, in the DoD's imaginary, humans in the form of military personnel, politicians, and populations retreat from view.

In his work on aerial drones, Shaw argues that autonomous weapons serve the interests not of a people or the health of a population, but of a world that is "predominantly nonhuman" (2016, 39). Indeed, to make the sea an operational environment, the DoD has come to rely on technological craft and scientific research. In doing so, geopolitical governance is redistributed away from the control of territory, land, and space and toward the management of knowledge and machinic production. However, much like territory, human action does not disappear in these experimental futures--and we can scarcely consider them nonhuman. Rather, humans are redistributed, displaced. Machinic warfare does not simply reshape the battlefield; it also reconditions the labor of war, reshaping what we have in common by reshaping what we know and how we produce technologies that engage with our environment.

If DARPA's calculus is correct, warfare at sea will become a tournament of machines. Humans are not erased from such a tournament; they prefigure it. This is DARPA's javelin into the spaces of the future: the behaviors of its actors—autonomous technologies—are built in anticipation of engagement. Through these investments in innovation, the front line runs ahead of conflict itself, in laboratories and algorithms in anticipation of geopolitical threats. If, as Amoore has written, *who* we are flows into the algorithms that govern autonomous technologies (Amoore 2017), *where* we are is displaced into the movement of mechanical bodies at sea as well as the laboratories that build them.

DARPA has awarded more than twenty-two million dollars in contracts to develop the UAV, UMV, and communication technologies that would make up Hydra's floating base infrastructure. This changing atlas of war finds the Navy's most crucial sites of engagement not in the sea itself, but in the sites of research and development: at Johns Hopkins University, Woods Hole Oceanographic Institute, MIT and in the laboratories of Leidos, Raytheon, Northrup

Grumman, and AeroVironment, where UMVs are imagined and put into production. The battlefield is thus not only where technologies are used, but also where they are produced.[5] In the process and as Louise Amoore and Rita Raley have noted, the military's technological programs shift responsibility away from human bodies and into experimental programming (2017). The construction of UMV technologies and responsibility for the shape and outcomes of warfare are therefore distributed among civilians, researchers, and the archives of science and engineering.

In the making of these military technologies, warfare is again increasingly distributed across the social body into innovation, just as Foucault described when he charted the rise of regimes of disciplinary and biopower. Now, however, the commonwealth is not constituted through its health or collective well-being, but through its productivity and capacity for innovation. It has become a commonwealth that is measured through the advance of a techno-power. As the labor of engineering has become the force of the military, the might of the nation state has come to reside in the minds of scientists, engineers, and programmers as well as in the conditions of their employment.

Conclusion

The javelin into the future that DARPA throws in the form of UMV technologies attempts to remake ocean spaces as operational platforms. And although these militarized marine technologies and epistemologies are often more fragile than they seem, they reshape who and what constitutes our common world—and our future. Programs in technological advancement engage not a people or a population, but a multitude of capacities, intellectual and material (Virno 2004). If the wealth that is held in common is our knowledge of the conditions of the world, much of this knowledge is currently shaped, harnessed, and wielded in the making of the

global military state. Rather than DARPA's imagined network of autonomous machinery, we might consider the true Hydra and Leviathan to be entwined in the labor of lives on land and at sea. Unlike the Leviathan in Hobbes's imaginary, however, the US military's monstrous creations do not save the people from a brutish state of nature. Instead, they unite labor in creating and extending a militarized epistemology that, in this case, reimagines the planetary seas. In the process, the turbulent ocean and how we come to know it—how we come even to know its conditions of turbulence—are therefore conditioned by imagined and anticipatory futures as well as histories of state violence that continue to circulate on- and offshore.

Mapping these arrangements and technologies reveals that sites of experimentation—distributed across the US and the world—are where the force of the US military apparatus might be challenged. In those sites of production, we might reimagine and recompose to engage with richer marine epistemologies in the service of a wider common world.

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NOTES

[1] The Advanced Research Projects Agency, later to become DARPA, was established by the Eisenhower administration in 1958 after the Soviet Union's Sputnik satellite orbited the earth, a technology that took the US completely off-guard. Its mission then was to "prevent technological surprise." In the intervening years, it has done so largely by facilitating some of the country's most transformative technologies, including the internet (originally ARPANET) and, more recently, driverless cars, which are the consumer beneficiary of DARPA's push for unmanned autonomous vehicles of all kinds.

[2] DARPA's annual budget typically hovers just under three billion US dollars. At approximately five-tenths of one percent of the DoD's total annual allocation (582 billion in 2017), it is minor arm of the broader US defense program. But in the world of technological research and development, the amount it allocates in grants to industry and university researchers has a significant impact on the direction of cutting-edge innovation. The National Science Foundation, by comparison, has a budget of approximately seven million dollars.

[3] While data on the number of drone related deaths is notoriously difficult to assess, the Bureau of Investigative Journalism estimates that US drones were used to kill somewhere between 5,734 and 8,853 people between 2002 and January 2017 in Pakistan, Yemen, Afghanistan, and Somalia. The website Airwars reports that American-led airstrikes were responsible for approximately thirty-one hundred civilian deaths in Mosul and Raqqa, Syria, from August 2014 to March 2017 (Almukhtar 2017). These deaths mark an erosion of conventional forms of military engagement characterized by front lines and the invasion of geographic territory.

[4] The number of active-duty personnel in the US military in 2011 had dropped to fewer than half of 1955 rosters and fifty thousand fewer than in 1995 (Coleman n.d.).

[5] This is not novel, but an extension of the experimental landscapes of the Bikini Atoll and the Nevada desert, where scientists tested the most devastating experiments of all time.