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Late modern war and the *geos*

In this article we work towards an ontology of war centred on the life of the planet, or *geos*. By *geos* we refer to the Earth and the life it sustains, including (but not limited to) human life. This is both an ethical and methodological move. While *death* is most readily collocated with war (and might even be considered *the* central organising principle for both makers and critics of war), life remains under-theorised in its relation to the way that we conceive war. That those who wage war deal in death – as an antithesis of *life* – does not mean that those who critique it need do likewise. It in fact ought to signal the opposite; to spur a set of ontologically antithetical questions: what if our analyses of war begin not with the technologies of killing but with the life that is targeted? What is brought into view when we shift focus from the distribution of death to the ecological sustenance of life? How is war conceived from the viewpoint of the ground and the life it sustains? In the ethics of attempting to prise the idea of war from the makers of war, we are thus led to profound questions on whose terms we know, study, and reproduce the idea of war. The *geos* (unlike the *bios* and *thanatos*) remains a comparatively neglected ontological category (Povinelli 2016); it might just be that approaching war from the angle of *geos* forces a productive conceptualisation of war in terms of bringing into view to-now obscured sites of military violence. Our concern, then, is not with adding to the already vast literatures on war ecologies (prominently: Austin and Bruch 2000; Gregory 2016; Nixon 2011) but to take them as a point of departure, to turn them back into our understandings of how war might – and indeed *should* – be conceptualised.

While we maintain that there is value in this move in relation to thinking about war in general terms, here we focus on the contemporary form known as “late modern war”; that which is marked by practices developed through technological advancements that accelerated in the early 1990s (Gregory 2006; Jabri 2006; 2016). As a term, late modern war does not aim to capture a neat or total transformation in warfare, but to serve as useful shorthand for the proliferation of advanced technologies that facilitate a mode of distanced combat and the use of “precise” weaponry. For its perpetrators (states with large military budgets) and arms producers, technological advancement can fulfil a promise of reducing – even *eradicating* – unnecessary civilian and military harm, such that wars might even be termed “humane” or “humanitarian” (Moyn 2021). Technology also underpins cognate claims around the social and political (re)ordering of communities targeted by war (those frequently presented as “failed”, “pariah”, or “rogue”) whose transformation is aided by pinpoint targeting so as to preserve civilian infrastructure for a future of liberal democracy (Der Derian 2001). Beneath such claims to virtuosity lies a particular set of ontological assumptions orientated around the *doing* of war: military strategy, technological advancement, in/humane violence, il/legal intervention, aeriality, remoteness, targeting, and so forth. Crucially and carefully, we argue

that these ontological assumptions are prominent even in accounts that are highly critical of war in contemporary international relations. That is, for both the makers and critics of war, a “militarised ontology” consists in the shared bounds within which *the idea of war* is conceived and reproduced. Writing against this ontological lock in, the article turns to the *geos* to sketch out an explicitly anti-militaristic ontology of war that could have significant ethical and political consequences for research agendas in IR, war studies, and beyond.

In methodological terms we take a lead from feminist scholarship on war, which has done so much to render visible the ways that military violence permeates different domains *outside and away from* (normatively understood) theatres of war while also critically questioning *what war is* (e.g., Hyndman 2007; Sylvester 2013). What follows is a cognate project; one that critically interrogates what constitutes war by ‘studying up’ with a primary focus not on gender but on similarly marginalised categories of ecological and non/human life. To be clear, we do not claim that there has been a total absence of critical analysis of war’s ontology (e.g., Barkawi and Brighton 2011), nor on the environment and non/human life. From insightful critique of late modern war’s toxic landscapes (Nixon 2011; Pugliese 2020) to reports produced by NGOs (HRW 2009; PENGON 2015), journalists (Ahmed 2013; *The Nation* 2020), and international agencies (UNEP 2003; WHO 2001), there is a massive body of evidence on the environmental fallout of war. Yet, a logic threaded through this work is that the *geos* is an *aftermath*, a more-or-less *collateral effect* of combat. As collateral – that is, as *unintended* or *excess* violence – the *geos* is never brought fully into a discussion of what constitutes war. At most, there is an emerging concern that war’s materialities (munitions, residues, emissions) can be harmful to military personnel (Nixon 2011, 204-232) with barely ever a full consideration of parallel and no doubt extended effects for ecologies and racialised populations targeted by those personnel. In aggregate, we know more about drone operators and returning veterans (Asaro 2017; Gregory 2011) than we do of those who live in war’s landscapes. What does this tell us about not only the nature of war but the nature of *critique*? What contingencies persist between the two? And how can war be known with a different emphasis, one centred on the targeted *geos*?

A key claim we make in answering these questions is that our existing normative *and* critical ideas of war are incommensurate with the violence we bear witness to on (and *in*) the ground. At sites in Gaza, Iraq, and Afghanistan (and likely Syria, Ukraine, and Yemen), what are taken as precise and therefore temporally and spatially contained practices of warfare in fact set in course enduring *geos*-centred effects. Early onset cancers, renal failure, and congenital disorders are each documented by medical and epidemiological professionals working in post/conflict contaminated landscapes (Alaani et al. 2020; Manduca et al. 2017; Naim et al. 2012) that denote, importantly, a contingency between targetable (that is, *racialised*) life and the targeted ground. Yet while such enduring effects are documented and prevalent, they remain almost entirely outside discussions on war in IR and cognate disciplines (e.g., human geography, political science, war studies). The intensity with which late modern war impacts the *geos* signals that our modes of inquiry must more fully reconcile with these effects; it also suggests that there is political work in

the continued *decentring* and *denial* of war's ecological violence. To presidents and generals, to Boeing and Raytheon executives, war is many things: a technical, moralising, precise, and efficient exercise in power – it is *never* an environmental intervention, emphatically *not* an assault on the *geos*. Quite the opposite: as we discuss below, advanced militaries now promote green agendas to reduce emissions and protect biodiversity. There is thoroughgoing critique of such agendas (Bigger and Neimark 2017; Leep 2022) but minimal discussion on how the *geos* might redraw the ontological lines of war. Once we begin to conceptualise war not from those who make war but by beginning at war's disperse effects on life, we can begin to break apart the militarised ontology of war.

Over four sections, we work towards an ontology of war tethered not to advanced technologies of war but to the ground and life that are targeted. First, we examine how different makers of war (states, militaries, arms manufacturers) conceive *geos*-war relations as variously a foreclosed *absence*, a *threat* to operations and stability, and/or a technical *challenge* for greener military technologies. Formed through these positions, we argue, is a “militarised ontology” of late modern war that centres on the figuring of violence as spatially and temporally “precise” and thus determinable and contained, with the *geos* and war remaining ontologically discrete categories. The second section explicates how such a militarised ontology sustains also within the predominant ways that the *geos* is addressed in recent research critical of war: as an *absence* via a concentrated focus on precision; as a *threat*, which requires a juridical solution; and as an *aftermath* that is importantly parsed off from the doing of war. In this way, war remains constituted through perspectives of makers and technologies of war, rather than the communities and human/non-human life that is targeted. Writing against contingencies between critique and a militarised ontology of war, in the third section we learn from feminist writing on post/conflict and ‘critical war studies’ (e.g., Barkawi and Brighton 2011) to set out a theoretical path for knowing war on different terms, from the *geos*. The fourth section presents war from this particular vantage point, building from existing evidence of war's damage to the Earth's constitutive elements – soil, water, and air – and connected effects on (human and non-human) life. Beginning in this ecological sustenance of life, war appears in a form that critically contrasts with a large part of current work in IR. It is no longer a primarily accelerated, aerial or remote activity but rather an enduring, terranean, and proximate intervention in the environment and the life it sustains. A concluding section outlines the significance of such a perspective for the study of war in IR and beyond.

1. A militarised ontology of late modern war

This section presents a concise survey of how the *geos* is positioned by those who make war – states, militaries, and arms manufacturers – to forward a case that there are three principal articulations of the *geos*-war relationship: as an *absence*, or the implicit foreclosing of war's environmental consequences; as a *threat*, or a newly significant cause of reduced military capacity and global instability; and as a *challenge*, or an opportunity for greener military technologies. Taken together, these narratives articulate a mutually reinforcing set of ontological assumptions that maintain distance between the doing of war and *geos* by

figuring violence as spatially and temporally “precise” and thus determinable and contained. We identify this as a militarised ontology of war that constitutes the parameters of strategy and justification (our focus in this section) *and* functions as the ontological bounds of critique (our focus in the next).

The implicit foreclosing of war’s environmental consequences is set in the foundations of how late modern war is understood. That is, the very idea of late modern war is grounded by technological advancements that make operations swift, precise, and with minimal “collateral” damage. The First Gulf War (1990-91) is widely taken as a historical marker in this contemporary form of war, where the trialling and exhibiting of precision capabilities announced an era in which American military operations would be “decisive, requiring the high-quality personnel and technological edge to win quickly and with minimum casualties” (US Secretary of Defense Dick Cheney, 1993). Subsequently, technology and speed came together in formal military strategy with a moralising and humane purpose: “[t]he American people expect decisive victory and abhor unnecessary casualties. They prefer quick resolution of conflicts and reserve the right to reconsider their support should any of these conditions not be met” (1993 US Army Field Manual, quoted in Erdmann 1999, 363). This strategic vision has since permeated tactical procedures where the “compression of the kill chain”, “personality strikes”, “signature strikes” and similar initiatives are now commonplace as modes of a distinctly precise and rapid distribution of violence (Gregory 2011; Jones 2020; Wilcox 2015). Militaries allied to the US have followed suit: UK Defence Doctrine is built around ‘tempo, deception, simultaneity, pre-emption and agility’ and capacities to minimise civilian exposure to combat (MoD 2022, 15); and the Israeli Defense Forces *Tnufa* (English: “Momentum”) programme ‘seeks to shorten the time of a conflict while achieving more success on the battlefield and lessening the impact of war on civilians’ (Frantzman 2020). Such strategic emphases undergird a general shift to ideas of “surgical” or “quick-fix” operations (Shaw 2005, 76-77) whose violence is pinpointed and thus discriminate. Damage to the environment is therefore an implicit impossibility; the *geos* is figured as *absent*.

The accompanying narrative that civilians are less exposed to danger is recurrent, and an integral rhetorical and operational principle of late modern war. This is most readily illustrated in the often-repeated claim that “there hasn’t been a single collateral death”, and that this is owed to “the exceptional proficiency, precision of the capabilities we’ve been able to develop” (Shane 2011). These particular words are those of John O’Brennan, President Obama’s counter-terrorism advisor, speaking in defence of CIA drone attacks on the Afghanistan-Pakistan border in 2011, but they could be the words of any similar such figure on any similar such operation (see Rockel 2009). In concert, arms companies such as BAE Systems market precision munitions as capable of ‘serv[ing] two equally important goals – to degrade or *destroy very specific targets* to eliminate key threats, and to *minimise collateral damage to noncombatants, materiel, and facilities that are located near those targets*’.ⁱ Lockheed Martin boasts that its MHTK (Miniature Hit to Kill) missile ‘destroys threats through an *extremely accurate application of kinetic energy* in body-to-body contact ... eliminat[ing] the incoming threat while reducing the risk of collateral damage’.ⁱⁱ This exactitude makes it possible to only target “legitimate” combatants, and limit other forms of collateral damage, including to the environment.

Violence is thus fixed in time and space, and war is made more humane, or even virtuous (Der Derian 2001; Zehfuss 2011), serving a long-held military concern of separating legitimate targets (“combatants”) from off-limits “non-combatants” (Kinsella 2011). Where “no collateral deaths” is accepted, there are no further consequences, no possibilities that the violence of war exceeds the act of *doing* of war. No collateral thus denotes not only “no civilian harm” but no consequential harm *in toto*; the *geos* remains an absented figure.

But what of the more specific military discourses that *do* address the environment? Climate change in particular connects to a newly prominent articulation of the *geos*-war relationship in which changing environments present a *threat* both to military operational capacities and to geopolitical stability. On the former, the changing *geos* is perceived as a substantial potential inhibitor – ‘greater temperature extremes, sea level rise, significant changes in precipitation patterns and extreme weather events test the resilience of militaries and infrastructure’ (NATO 2022, 5) – that necessitates further technological adaptation: increases in ambient temperatures coupled with changing air density (pressure altitude) can have a detrimental impact on fixed- and rotary-wing aircraft performance ... these are not only challenges to engineering and technology development, but must also be factored into operational planning scenarios (NATO 2022, 5). Numerous military and defence department task forces (e.g., Parliament of Australia 2018; Ministère des Armées 2022) have been created to respond to climate as a ‘threat multiplier’ (Crawford 2022, 203-228). Importantly, however, this threat also produces a *necessity* for operations where drought and flooding exacerbate the issues of resource scarcity that precipitate conflict. British Army (2021) communications, for example, push the point that higher temperatures and rising sea levels ‘magnify’ the fragility of ‘security hotspots’, and the US Army Climate Strategy (2022, 4-5) explicates ‘dangerous’ climate change impacts will ultimately result in a ‘less secure world’. Via a reinvigoration of familiar tropes of “fragile” and/or “ungovernable” territories (Joronen and Griffiths 2022), and the recurrent idea of the “resource curse” as a basis of war (Swain and Krampe 2011), climate change forms the basis for renewed vigilance and thus increased technological innovation and investment. In important ways, then, the *geos* appears as a figure that threatens global stability.

A connected role of the *geos* in contemporary military strategy and practice is that of a *challenge* for greener military practice. The NATO-sponsored volume *Warfare Ecology* (2011) is a relatively early articulation of such an agenda, and is notable for a sustained focus on the how to ‘mitigate or reduce the environmental consequences of warfare’ so as to ‘help avert resource conflicts, [reduce] degradation of war-dominated ecosystems, and increase post-war restoration of ecosystem services’ (Machlis et al. 2011, 3). This ‘ecological turn’ gained momentum towards the late 2010s as militaries began presenting as conscientious, pro-active and solution-bearing environmental actors (see Bigger and Neimark 2017; Harris 2015). In the US Army’s first *Climate Strategy* (US Army 2022) there was a promise of 50% reduction of emissions by 2030, and net-zero before 2050 via the use of greener technologies in supply chains, fuels, and operational equipment. In similar fashion, the UK Ministry of Defence’s (MoD) *Climate Change and Sustainability Strategic Approach* (2021, 18) sets out a pathway to achieving net-zero by 2050, and the Israel

Defense Forces (IDF) has numerous green initiatives, including the ‘Nature Defense Force’ (NDF) – an expression of the “[military’s] love of the land, the landscape, the nature, and the environment”ⁱⁱⁱ – which comprises no fly zones around migratory birds, litter-picking, and rescue animals trapped in (military) barbed wire. In these ways, the *geos* presents a *challenge* for pro-active militaries to tackle.

In this necessarily abridged account of the ways that different actors involved in the making of war (states, militaries, arms manufacturers) figure military operations, the *geos* takes multiple (and somewhat contradicting) positions; it is variously foreclosed and acknowledged, an alternatively absent yet emerging agenda. But within these contradictions and differences, a consistent underlying logic persists: whether as an *absence*, *threat*, or *challenge*, the *geos* ranges in function from afterthought or addendum to a realm of “greening” (or greenwashing) intervention or justifying cause for preparation (and expenditure). It is never constitutive of war itself. Military violence is thus held as spatially and temporally “precise” and therefore determinable and contained, entirely separate from the Earth and life it sustains. Such is the militarised ontology of late modern war that works to maintain a dividing line between the violence of war and the *geos*.

2. A militarised ontology of late modern war in critique

If the previous section aimed at something of an open goal, then the work of this section requires a more measured approach. Our argument is qualified but sure: a militarised ontology of war persists even within current scholarly critiques of war. We arrive at this argument via a survey of existing scholarly critique in which the *geos* is figured either in similar fashion (as an *absence*) or as an environmental violence at a remove from the making of war itself (as a *juridical problematisation* or temporally bound *aftermath*). To be clear, we do not write in an accusatory manner since we recognise both that the *geos* is simply beyond the scope of certain inquiry and ontological commensurability is a key critical approach. Yet, for all that is gained by interrogating war *on its own terms*, there is, we explicate, an aggregate effect of remaining within a militarised ontology that maintains distance between the violence of war and the *geos*.

Our claim of an absent *geos* in a majority of research is a straightforward one: a main objective of inquiry is to explicate and critique evolving military procedures, especially as they relate to advanced technologies, with never more than a secondary focus on the environmental effects of those procedures. A primary theme to this end is formed around the *compressed*, *efficient* and/or *pre-emptive* temporalities that mark the late modern practices of war. Time-as-*compressed* – as accelerated, sped-up and so forth – is a key conceptualisation that comes through in seminal works focused on ‘kill chain’ compression (e.g., Gregory 2011) or the reduced time of ‘dynamic targeting operations’ that ‘emerge during ‘live’ battle’ (Jones 2020, 24). *Efficiency* is a cognate focus that emphasises military moves to instrumentalise technological advancements towards “surgical” operations via practices ranging from ‘signature strikes’ based on ‘pattern of life’ data (Wilcox 2015) to the development of context-specific munitions such as ‘roof knocking’ light explosives in urban settings (Joronen 2016) and ‘bunker bombs’ in mountainous regions (Bell 2008).

Viewed through these technologies, the pace of war is quickened, lives are obliterated ‘in an instant’ (Benjamin 2013, 28). *Pre-emption* is a further temporal thematic that draws attention to an epochal shift from a Cold War logic of deterrence to one of anticipation and eradication of (mostly exaggerated) threat. For Brian Massumi (2015, 10), pre-emption is the operational complement of a post-9/11 ‘threat-o-genic’ condition, or the ‘ontopolitics’ that consist in the movements between identifying, reifying, becoming, and – eventually – eliminating threat. In this sense, “unknown unknowns” are the anticipatory target that justify a large part of contemporary military intervention (see e.g., Aradau and Van Munster 2012; Graham 2010, xii).

Brought together, this work presents important critique of the technologised, aerial, and/or remote distribution of asymmetrical violence through which advanced militaries (the US, UK, Israel, allied forces) conduct operations in targeted areas (e.g., Afghanistan, Iraq, Palestine). We come to learn of nefarious and de-humanising military practices: the manipulation of legal frameworks and safeguards (Jones 2020); the collection and politicised interpretations of surveillance data (Wilcox 2015); and the shaping and creation of potential threats (Massumi 2015). Criticism is due, however, if we consider precisely *what war is* between the lines of these perspectives: just as war has become a techno-centric activity, so has critique; by adopting a methodologically commensurate perspective we remain within a militarised ontology that bounds off the longer durée of war. This is not to argue that prominent critics do not recognise an important *de-compression*, *in-efficiency*, and/or *aftermath* to contemporary war, but the ways these are framed are instructive. Derek Gregory (2006, 93) refers to the ‘network effects’ of precision targeting that ‘surge far beyond any immediate or localised destruction’; Vivienne Jabri (2016, 209) notes the ‘wholesale destruction’ of infrastructure with serious long-term repercussions; and Stephen Graham (2010, 265) draws focus on the ‘prosaic’ health effects of war that amount to a ‘bomb now, die later’ logic. In each of these and other cases, there is a tendency to ‘briefly mention’ the environmental and health effects of war but it is typically ‘not the place to delve deeply’ (Belcher 2011, 6). With these references we do not direct critique towards individual scholars, we wish rather to draw out the cumulative effects of (re)producing research agendas in which the *geos* is either peripheral or entirely *absent*.

This is not the case for legal scholars and practitioners, for whom the failure to address war-related environmental crime both renders war unnecessarily harmful and threatens the legitimacy of the international legal order. Prominent results of these concerns are the international legal frameworks that followed the environmental fallout of post-war nuclear testing and US deployment of Agent Orange in Southeast Asia. Protocol I of the Geneva Convention (1977) explicitly outlaws means of warfare that cause ‘widespread, long-term and severe damage to the natural environment’^{iv} and the Environmental Modification Convention (ENMOD) (1978) bans ‘the deliberate manipulation of ... the dynamics, composition or structure of the earth, including its biota, lithosphere, hydrosphere and atmosphere’ (article II).^v More recently, the Rome Statute of the International Criminal Court (1998) includes ‘long-term and severe damage to the natural environment’ as a war crime (Article 8(2)(b)(iv)).^{vi} As articulators of a *geos-war*

relationship, these bodies of international law are significant for the ways that a context such as the invasion of Iraq can be seen not only through the use of precision munitions but as an issue of burning oil wells and contaminated shorelines. This has led to attempts to hold states to account via recourse to environmental law as a basis of state responsibility for war-related ecological damage (Vöneky 2000) and through humanitarian law to establish accountability for long-term health effects in war's environmental aftermaths (Fidler 2000).

Yet this wider conceptualisation of the *geos-war* relationship does not signal a push against a militarised ontology of war for the base fact that legal interventions hinge on the question of illegitimate violence, thus functioning to reify the possibilities of *legitimate* military violence (see Redwood 2021; Dauphinee 2008). Where the thresholds of legitimacy lie is a crucial point of debate among legal scholars who note a vagueness to the requisite that culpability rests on proving 'widespread, long-term, and serious' environmental harm – one that can ultimately nullify laws (Hulme and Weir 2021; Schmitt 2000). In addition, legal deliberation over environmental harm takes place in dialogue with principles in international humanitarian law of military proportionality and necessity such that the *geos* is placed in subordinate relationship to war: it is confined to juridical problematisation (i.e., as an il/legitimate target of war) as a temporally ordered (necessary) "consequence" of war.

This ordering of war's effects is prevalent in a third figuring of the *geos* that has emerged in the growing body of work on the ecological *aftermath* of contemporary war. Scholarship in this area focuses on, as Rob Nixon (2011, 205) has written influentially, 'a new fatal kind of environmental imprecision to "precision" warfare'. Nixon (2011, 220) argues that for munitions such as depleted uranium 'we're not talking about rogue missiles that accidentally shred a marketplace or a wedding party. We're talking about the triumphant, pinpoint strike that doubles as a chaotic weapon, a weapon that haphazardly strikes down civilians who ... just happen to live downwind in time'. Focused similarly on the temporal 'downwind', Joseph Pugliese (2020, 100) concentrates on Gaza's 'postbellum ecologies of the aftermath' in which the non/human body is subject to 'attritional violence ... [whereby] physiological processes of ingestion (of contaminated food and water), inhalation (of polluted air) and percutaneous absorption (of heavy metals such as lead) become inscribed with pathogenic and necropolitical effects'. For Pugliese, a 'forensic ecology' connects Israeli military assaults with an ecological violence that extends through Gazan time-spaces. Work that investigates such temporal and spatial extensions of war includes discussion of public health and military burn pits in Iraq (Rubaii 2020; Savabieasfahani et al. 2020), the effects on non-human species outside of 'recognisable times of war' (Leep 2022, 8), and the 'geontological' dissolution of life/non-life binaries in the aftermaths of "precision" warfare (Griffiths 2022). Late modern war from the angles presented across this research is anything but precise; it is a multi-temporal mode of violence that ranges from the spectacular and kinetic to the drawn-out and delayed – war's *end* is but a 'mirage' (Nixon 2011, 207).

The idea of end-as-mirage presents an opportunity to frame this particular thread of current research. While notions of ‘slow violence’ and ‘ecological aftermath’ provide a prompt for the discussion here, there are key shortcomings to be addressed. The idea, for example, that the residual effects of weapons unfold ‘gradually and out of sight’ (Nixon 2011, 2) betrays a telling positionality – out of *whose* sight? (Cahill and Pain 2019). Further, the temporal assumptions are instructive: what is the aftermath *after*? The only possible answer to this question is “the formal conclusion of military operations”, thus orientating us once again to an underpinning logic of *war is what militaries say it is*. The same goes for notions of “postbellum ecologies” (Pugliese 2020, 100), “toxic legacies of war” (Logan 2018), “the environmental consequences of war” (Austin and Bruch 2000), and so forth – each defers to the temporal impositions of those who make war. A focus on the *aftermath* of late modern war thus presents an important critical incursion into more-established modes of investigating military violence yet it does so without challenging the very conceptualisation of war itself.

In this section, we have sought to distil the primary ways that current scholarly critique of the practices of late modern war addresses the environment. *Geos* as alternatively an *absence*, *juridical prolematisation* or *aftermath* preserves (militarised) ontological bounds: war is a technological affair and ecological violence is set at il/legitimate levels in a secondary temporal order of “consequence” or “aftermath”. As will be clear by now, we wish to consider a *geos*-war relationship without the adjunct-ness of “after”; if it is true that war has disperse effects, then we should hold them as importantly constitutive of war, as a coeval, an integral part of our idea of war.

3. Feminist critical paths

Our turn to the *geos* takes a lead from feminist interventions in the study of war. These make visible the ways that military violence enters domains *outside and away from* theatres of war while also questioning key assumptions around *what war is*. What we propose here is a cognate project, a vision of war gained by ‘studying up’ with a central focus not on gender but on the similarly marginalised categories of environmental and non/human life. In this section we explicate the feminist methodological and epistemological antecedents of a turn to the *geos* and relate a resulting ontology to debates in international relations on war as a subject of study.

Feminist IR provides a clear methodological and ethical lead on the study of war. A key intervention consists in the imperative to displace “high politics” as the locus of inquiry in favour of ‘study[ing] up from people’s physical, emotional, and social experiences’ (Sylvester 2013, 2) to gain a vantage point on war ‘from below’ (Fluri 2009). In methodological terms, this importantly shifts a point of entry into critique away from the level of the state and militaries to those affected by war. From here, we are brought to military violence through the discursive and embodied accounts of otherwise marginalised voices, for instance those of military wives (Enloe 2016); survivors of sexual violence (Steans 2021); and

racialised women living under military occupation (Shalhoub-Kevorkian 2009). A feminist approach thus makes visible previously unseen sites and subjects of violence, bringing into the light the women on whose labour and vulnerability the re-production of military violence depends (Griffiths and Repo 2021), as well as the (re)making of gender through relations of war (Tidy 2018) and the always-connected production of racial categories in practices of targeting and killing (Fluri 2014). A lesson here, crucially, is that ‘war keeps going’ along temporal and spatial planes, producing effects *long after* and *far beyond* conventionally recognised sites of military action (Pain 2015, 66). A model can thus be extracted of centring an important yet under-researched site of military violence (a gendered and/or racialised body, a toxic aftermath), trace its trajectories of violence through time and space, while all the time thinking reflexively about (the disruption of) research agendas and disciplinary assumptions (or explicitly: why aspects of war can indeed be assumed “after” or “beyond” in the first instance). Christine Sylvester (2013, 3) makes the simple but wholly consequential point that ‘injury is the content of war not the consequence of it’ as a basis of pointed disciplinary critique: ‘by treating war at a higher level of analysis, focusing very often on causes and correlates of war, on war strategies, weapons systems, national security interests and the like, IR repeatedly makes injury into a lamentable and regrettable consequence of the “normal” violence of war’.

In this way, feminist approaches to war articulate with a broader body of critical literatures that turn a focus inwards to the question of *what war is* in terms of the ontological assumptions that underpin critique. Jairus Grove (2019, 70), for instance, urges a level of dissonance between a reflexive recognition that ‘war, as a concept is a *participatory* territorialisation; its definiteness is lent to it by *our* interest’ (emphasis added), laying bare a critical ‘participation’ in establishing ‘what war is’ in the discursive reproduction of war with the corrective that ‘war [*also*] ... resonates without our interest because it is a real fabric of immanent relations making and being made by milieus’. We read this as a caution against falling into a “representational trap” of reducing war to *only* a discursive frame alongside an attendant concern with what might constitute the ‘real fabric of immanent relations’, or as we forward here: the make-up of war centred on the life of the planet, or *geos*. Connectedly, and prominently, Judith Butler’s (2009, xiii) work on ‘frames of war’ calls forth an awareness of that which is excluded when we conceptualise war and, crucially, how discursive frames relate to – and shape – material ‘realities’ of war:

How do we understand the frame as itself part of the materiality of war and the efficacy of its violence? The frame does not simply exhibit reality, but actively participates in a strategy of containment, selectively producing and enforcing what will count as reality ... the frame is always throwing something away, always keeping something out, always de-realising and de-legitimising alternative versions of reality, discarded negatives of the official version. And so, when the frame jettisons certain versions of war, it is busily making a rubbish heap whose animated debris provides the potential resources for resistance.

If the mainstreaming of feminist IR can be hailed as a successful push against such jettisoning then we can be explicit here: we are prompted to seek the same result for the *geos*, for late modern war’s relations with

the environment to be brought more centrally into the conceptualisation of war itself. This would, if we allow a moment of ambition, respond to an important disciplinary challenge: ‘what happens if we approach the international as a distinct social space from the perspective of war, rather than approach war from the perspective of the international system of states?’ (Barkawi 2011a, 712). To address this provocative question (see Barkawi 2011a; Barkawi and Brighton 2011), a turn to the deeper ontological underpinnings is necessary: where are the temporal and spatial bounds of war established? What ‘real fabric of immanent relations’ might break them apart? And, crucially, to what material end? Turning back once more to the gains of feminist interventions that bring into view the materialities of marginalised lives in relation to war, an outline of an objective forms around the potential material gains vis-à-vis the *geos* and the life it sustains. Just as war categorises and targets particular bodies, so too does it distinguish and diminish the Earth and its life-sustaining systems. The targeting of (certain) human life is not a discrete act from the targeting of ecological systems, and parsing off human injury and death from environmental harm and eco-cide only reiterates militarist (and capitalist more generally) society-nature divisions that play out, most commonly, on racial lines. It is towards unpicking these multiple ontological binds that we centre the *geos* in an ontology of war in the final section of this article.

4. Towards an ontology of war centred on the *geos*

The environmental effects of recent late modern military practices are significant. For example, a large-scale investigation published by the Palestinian Environmental NGOs Network (PENGON 2015, 19; 32) criticises Israel’s ‘massive use of unconventional weapons’ in 2014 (‘Operation Protective Edge’) that left residues to ‘percolate slowly into the aquifer, adding pollutants such as cadmium, copper and lead [that] pose serious health risks including cancer’. One example of an ‘unconventional weapon’, white phosphorus, is present in high concentrations in the soils of northern Gaza, giving cause for scientists to warn that it could ‘destroy the natural ecosystem of animals and plants and contaminate agricultural products through the food chain ... caus[ing] health problems especially among children and the elderly’ (Hamada et al. 2011, 297; Manduca et al. 2009). Similarly, around the Iraqi city of Mosul, soil scientists have detected high levels of depleted uranium that, they argue, can open new ‘pollution pathways’ that ‘may have serious impacts on the regions’ food chains and subsequently on human health across Iraq: largely through plant uptake and edible food crops’ (Fathi et al. 2013, 7). An analysis of spatial distribution and risk assessment of depleted uranium deposits from the two Iraq Wars in the southern city of Basra Governorate found that ‘it seems clear there is an increase in the uranium isotopes in soil surface due to exposure to these weapons during combat manoeuvring by American troops causing cancer significantly among Basrah populations’ (Yahya et al. 2013, 2). In Afghanistan, the ‘Toxic Remnants of War’ project (2014) catalogues a range of war remnants – e.g., munitions, [abandoned] military vehicles and materiel – whose continued presence ‘expos[es] people to toxic substances and metals’ as they ‘release into the atmosphere and leach into soils and groundwater’.

As for effects on resident populations, there is a growing body of evidence that connects remnants of war, environment, and public health. Research by oncologists in Basra, for example, attributes higher-than-normal levels of uranium in blood samples of leukaemia patients to the fact that ‘Basrah is the region which received the highest amount of DU [depleted uranium] during the Gulf Wars’ (Al-Hamzawi et al. 2014; 127). In Fallujah, medics have found that ‘the metal load of *Fallujies* in general is unusually high for metals associated with weaponry’ and that this ‘can condition differently [miscarriage] and [birth defects]’ (Alaani et al. 2020, 8; Alaani et al. 2011; Al-Sabbak et al. 2012). Examination of a 17-fold increase in congenital disorders in both Fallujah and Basra, in addition, identifies exposure to weapons residues and higher-than-normal (5–6 times) levels of toxic metals (mercury, lead, uranium) in the environment as a probable cause (Al-Sabbak et al. 2012). In Gaza, epidemiologists at Al-Shifa Hospital in Gaza City have found ‘strong correlation of [birth defect] newborns and parent’s exposure to attacks with [white phosphorus]’ (Naim et al. 2012, 1744-45) while studies into other ‘unconventional’ weapons such as so-called ‘weapons without fragments’ – i.e., DIME (Dense Inert Metal Explosive) or ‘tungsten bomb’ – demonstrates the presence of toxic and carcinogenic metals in the fragment-free wounds they produce (Heszlein-Lossius et al. 2020; Skaik et al. 2010). Connectedly, a large-scale study into the health of hundreds of pregnant women and new born babies from Gaza following the 2014 bombardment found significantly high levels of heavy metals – tungsten included – that doctors interpret as evidence that ‘the risks posed by the war remnants are diffuse, may not be limited to reproductive health and may also affect the frequency of pathologies such as cancers, male sterility, immunity and endocrine disorders’ (Manduca et al. 2017, 19).

According to this evidence, life lived in the contaminating processes of the war-affected *geos* (e.g., seeping, leaching, drifting) is brought to thresholds of toxicity, carcinogenesis, and teratogenesis. These thresholds also stand (*and thus form passage*) between any putative life/non-life (or society/nature) divide; the life of human populations and the ground are co-dependent, co-constituted via contingencies and continuums. So as *not* to exclude those forms of non/life pushed beyond those thresholds (the toxic, cancerous, mutated) from analysis of war we must re-figure underlying assumptions around spatiality, the pace(s) of violence, and the range of bodies affected. In spatial terms, we are moved from the aeriality of war (drones, GPS, surveillance) to ground level, the particulate-carrying air on its surface and the contaminated soil below it. The subterranean is therefore not significant for bunkers or tunnels (see Bell 2008; Slesinger 2020) but for seeping and leaching materials deposited by the aircraft overhead. Munitions thus become less objects of precision and kinetic power than an assemblage of Earth’s materials that are mined, repackaged, and re-deposited elsewhere; bombs of cadmium, phosphorus, uranium transported to new and threatening coordinates. The remoteness of late modern war gives way to a proximity: the drone vans of Nevada are secondary to the body’s intimacy with the ground that sustains life. If war’s toxic remnants affect breathing, drinking, and eating then ‘remoteness’ diminishes in analytic value, telling perhaps only of an analyst’s particular positionality. In temporal terms, the speed and acceleration that somewhat defines current understandings of late modern war loses prominence for an antithetical set of

questions centred on the protracted processes of leaching, seeping, drifting, bleeding, metastasis, mutation, gestation, remission, relapse and so forth. These processes are central to the effects evidenced by doctors at key sites of late modern war (e.g., Fallujah, Mosul, Gaza); it is remiss to therefore turn so readily to ideas of acceleration to guide critique. Conversely, but for similar reasons, the turn to an idea of “slow violence” must also be questioned: ‘slow to whom? Whose gaze is privileged’ (Cahill and Pain 2019, 1058). Carcinogenesis can certainly be said to be “slower” than a real-time targeting mission, but it serves to remember that health deteriorates ‘quite rapidly from the most important perspective, that of one whose life is degraded by the ground made toxic by war’ (Griffiths 2022, 292-293). Finally on temporality, and as we have argued: nothing happens *after* war if “after” defers to the military’s declared end of war; where violence continues, war continues.

This brings us to the range of bodies affected by war. On the people we think of as connected to war, thinking through the *geos* breaks apart the established categories that are tied to militarised ontologies of war. “Non-combatant” or “quasi-combatant”, for example, depends on the ongoing presence of a belligerent other; “collateral” belongs only to the imaginaries of military administrations and arms manufacturers; and “civilian” is tied to the contested question of who is targetable under international law. In each of these examples, at war’s end – or when a military declares a conclusion – these subject positions dissipate, revealing them to be tethered to a militaristic ontology and leaving the problem of how to address lives lived in the context of war’s enduring effects. The three main categories that hold “beyond” war are notable for what they disclose of the *geos*: “refugees” are those caught within war’s *humanitarian* (much less so: *environmental*) legacies; “veterans” is a term reserved for the personnel charged with distributing military violence; and “injured” refers to bodily harms sustained during officially recognised military operations. Where weapons visit harm not through kinetics but as toxic materialities, our idea of “injury” is insufficient to capture anything of the cancers, renal failure, or congenital defects that mark the epidemiologies of “post”-war populations. How is an encephalopathic baby born to parents living in a bombed-out neighbourhood of Fallujah addressed as a subject of war? In response it should be more than a curiosity to foreground that the US Government recently passed the PACT Act (2022)^{vii} that made \$280bn available for ex-military personnel suffering the long-term illnesses of war. Significantly, the law removes the burden of proof and dictates that certain respiratory illnesses and cancers should automatically qualify for subsidised healthcare. What this case highlights, if it needs to be pointed out, are the persisting colonial geographies of race and credibility: doctors in Iraq are routinely discredited (see Logan 2018; *The Nation* 2020) for documenting the same and worse patterns of health that the United States recognises as effects of war for its own citizens. Holding these geographies in sharp relief, we see more clearly the coming together of target-able tracts of the planet and inhabitants of that land, how populations are racialised via and through exposure to a damaged *geos* (see e.g., Voyles 2015; Theidon 2022). It is a product of colonial racial legacies that there is no temporally equivalent and civilian form of “veteran” to denote people exposed to *precisely the same and worse* conditions in places bombed by the Western military personnel whose own

health conditions are subject to both academic inquiry and state-funded healthcare. That there is no accepted term of address for those whose lives (and deaths) are intimately tied to the war-affected *geos* tells us that we are under-equipped to address the marked racialisations of war's participants and victims, and that we are thus in new – and urgent – ontological territory.

To the *geos* itself, where it all begins. Alongside the redrawing of ontological bounds in terms of space, time, and categories of affected populations, attending to the harm visited on the ground by militaries urges a re-focus on the ways we conceive a war-Earth relationship. This is where the term *geos* gains critical purchase. Listening to the soil scientists and medics cited above, the ground cannot be perceived as solely a backdrop against which war plays out, nor is it reducible to contestable “territory” that drives war. Instead, the Earth's constitutive elements – air, soil, water – are recognised as contingent with the life and health of that which it sustains. In the words of Traci Brynne Voyles (2015, 218): ‘as human skin is the permeable, breathing, living boundary that regulates our relationships with what is not us, so are the boundaries between peoples, and between ecological systems, permeable, silted, breathing and relational’. This co-dependence conceded or restored, war ecologies thus become not a siloed area of study but a site generative of critique that bridges life/non-life (or society/nature) divisions. The racialising function of ecological damage can from here be more clearly articulated: to designate ground targetable is simultaneously to identify an expendable human population. It is an obvious but important point that the period of late modern war coincides with a renewed Western zeal to bombard predominantly Arab areas of the world. Our analyses of war should not be so readily accepting of nature-society dualisms that are produced through the strong colonial impulse to parse ecology from race; we must recall that the severing of indigenous relationships with the land ‘has a *particular* history, tethered inescapably to settler colonialism, rapacious capitalism, and plunder’ (Theidon 2022, 80, original emphasis; see also Gill 2023). Approaching war from the perspective of the *geos* can break the bounds of those *particular* ontologies, thereby enabling a mode of critique that pushes against colonial trajectories of thought. The *geos* in this way both unlocks and is unlocked: it on the one hand serves as a way of perceiving war on distinctly different terms from militaries, states, and arms producers, while on the other it shines analytical light on the assumptions we make of “nature” and its relations to war. The *geos* thus emerges as both a primary tool and site of analysis if we are to understand war in non-militarised terms.

Conclusions: towards a research agenda on war and *geos*

A large part of what is known about war remains tethered to a militarised ontology. Both war makers and critics of war are centrally focused on an assemblage of hardware (drones, GPS, precision weapons), software (pattern-of-life data), and ideas (e.g., acceleration, aeriality, targeting). While clearly separated along important ethical and ideological lines, both bring war into view – whether from a strategic or critical perspective – as a technological, time- and space-bound activity whose effects are commensurately delimited. In explicit terms, the long-term effects of war on the life of the planet are discounted; the *geos* is

either entirely absent, or it is peripheralised as a threat, challenge, legal problem or aftermath. Our objective here has been to turn around current understandings by asking what if our analyses of war begin not with the technologies of killing but with the life that is targeted? And consequently, what is brought into view when we shift focus from the distribution of death to the ecological sustenance of life?

In responding to these questions, the article makes methodological, theoretical, and ethical contributions to IR, war studies, and beyond. Methodologically, a turn to the *geos* challenges us to de-centre the perspectives and experiences of states and militaries. Just as feminist approaches teach a mode of studying up with an emphasis on gender and the body, a *geos*-centred inquiry directs us to the ground and those lives that are sustained and made precarious by the war-damaged environment. More broadly, as feminist IR foregrounded sociology, philosophy, and psychology in the study of war, the work we begin here indicates further inter-disciplinary needs where geographical, epidemiological, or oncological knowledge can point us to key aspects of war that are currently on the fringes of our own discipline. In theoretical terms, and as we have centrally argued, beginning in the ground re-draws the ontological lines of war in terms of spatiality, the pace(s) of violence and the range of bodies affected. As critics, we are thus prompted towards under-studied relations between the land and non/human life, the contingency between the two with the key corrective that war's violence on the environment and body is, in Christine Sylvester's (2013, 3) words 'the content of war not the consequence of it'. Taking this intervention seriously entails subtle but substantive re-figuring: toxic presences are not "residues" of war, they are its products; ecological "aftermaths" are not an adjunct to war, they are its substance; and the idea of "collateral" loses all purchase because we begin from war's effects and not from military intent. That violence emerges "downwind" does not – *cannot* – excuse the makers of war from proper scrutiny. The issue of scrutiny brings us to an ethical point. As we have maintained throughout, our principal concern here has been to think through the implications of contesting accepted ontologies of war, closely attending to what is left out. The final part of Judith Butler's (2009, xiii) words quoted above (section 3) take on renewed prominence to this end: 'when the frame jettisons certain versions of war, it is busily making a rubbish heap whose animated debris provides the potential resources for resistance'. By taking the (literal and figurative) debris, we can focus more clearly on a mode of war violence whose effects we currently know little about, thereby going some way towards redressing the discomfiting fact that we know so much more about those who make war than those who live in targeted areas. We might too open new avenues of political accountability that reach the manufacturers who fashion the Earth's elements into the instruments of war and the politicians who authorised their use that eventually makes them debris.

The ontological shift we seek to provoke, therefore, is also driven by an aim to both make visible forms of violence directed at the *geos* and to make accountable the assemblage of agents that distributes that violence. In these terms, the environmental "aftermath" or "fallout" of war is no longer an adjunct to war, it is rather the base from which we understand and critique the effects and practices that we name "war".

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ⁱ <https://www.baesystems.com/en-uk/productfamily/precision-guided-munitions> (emphasis added)

ⁱⁱ <https://news.lockheedmartin.com/2018-01-30-Lockheed-Martin-Miniature-Hit-to-Kill-Missile-Demonstrates-Increased-Agility-and-Affordability> (emphasis added)

ⁱⁱⁱ <https://www.idf.il/en/mini-sites/directorates/technological-and-logistics-directorate/nature-defense-forces/>

^{iv} <https://ihl-databases.icrc.org/en/ihl-treaties/api-1977>

^v https://treaties.un.org/doc/Treaties/1978/10/19781005%2000-39%20AM/Ch_XXVI_01p.pdf

^{vi} <https://www.icc-cpi.int/sites/default/files/RS-Eng.pdf>

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^{vii} <https://www.congress.gov/bill/117th-congress/house-bill/3967/text/pcs>