Research Perspectives and Boundaries of Thought: Security, Peace, Conflict, and the Anthropocene

JUDITH NORA HARDT

Centre Marc Bloch (An-Institut Humboldt University, Berlin) and Institute for Peace Research and Security Policy (Hamburg University), Germany

ABSTRACT: The geological era of the Anthropocene is expected to trigger a paradigm shift across the natural and social sciences. Within International Relations (IR), the arrival of the *planetary* has generated various debates that range from questioning the very future of the discipline to proposals for how to fix IR. This article takes stock of different research perspectives from three disciplines, namely IR, Earth System Sciences and New Materialism/Posthumanism. With reference to these different perspectives, it examines the ways in which peace, conflict and security are related to the Anthropocene. This panoramic overview reveals also certain demarcations between the research approaches, disciplines and study fields, and aims to trigger future research on overcoming these boundaries of thought and push the research on Anthropocene thinking further.

KEY WORDS: Anthropocene Thinking, Peace, Conflict, Security Studies, International Relations, New Materialism/Posthumanism, Earth System Sciences.

INTRODUCTION

The arrival of a new geological era, the Anthropocene, is generally expected to bring about a paradigm shift across the natural and social sciences because the descriptions of human-nature entanglement challenge not only traditional approaches but also the very foundation of sciences (Bennett, 2011; Hamilton, Bonneuil & Gemenne, 2015; Schellnhuber et al. 2004; Torrent, this special issue). Within International Relations (IR), the context of the planetary has initiated a debate that ranges from proposals on how to rework IR via, for instance, Planet Politics (see Burke et al. 2016), to the question of whether the planetary obscures the International (see Corry, 2020: 341) and to putting into question the future of IR altogether (see Chandler, 2018). This article is situated within these debates, and within this Special Issue that focuses more explicitly on the key pillars of IR, Security Studies (SS), Peace and Conflict Studies (PACS).

As a contribution to the critical reflection on the scope and limitations of IR, my aim is not to propose suggestions for how the Anthropocene thinking of securities, peace and conflicts could look like. Instead, this article presents some points of departure that are intended as an invitation to "think!" harder (Haraway, 2016), and to further develop the research on *Anthropocene thinking* (Cudworth & Hobden, 2011; Harrington, 2016). This is understood here as a process that encompasses the new paradigmatic changes that equally challenge all of the bodies of knowledge at stake in this research, and that enable us to think through more rigorously the new living context of a human-nature entangled world.

To this end it engages in two investigations that are structured into two separate sections. The first task, presented in the second section of this text, provides insights into the often little visible body of work from Peace, Conflict and Security scholars that focuses on environmental issues and outlines whether and how they have approached the Anthropocene.

In the second investigation, introduced in the third section of this article, I take stock of key approaches to the Anthropocene from two bodies of knowledge that have recently gained traction as a serious challenge to IR (see Castro & Saramago, 2020; Chandler et al. 2021; Edkins, 2019; Kurki, 2020). Both have treated the Anthropocene as a key concern. While Earth System Sciences have provided the scientific underpinnings and definitions, New Materialism/Posthumanism has supplied philosophical approaches to the Anthropocene. I address the (partially opposed) cosmologies, ontologies, epistemologies and methodologies of Earth System Sciences and Philosophy and combine them into what I refer to as *Anthropocene scholarships*. The exercise to merge the opposed cosmologies also helps to more explicitly confront PACS and SS with unfamiliar contexts and frames of the Anthropocene and invite future research on the relations between the three disciplines.

The three bodies of thought (IR, PACS, SS; Earth System Sciences; New Materialism/Posthumanism) are distinguished along the lines in which the respective authors place and title their work. The present analysis focuses on research that explicitly investigates the phenomena and terms of the *Anthropocene*, *security*, *conflict* and/or *peace*. These diverse research perspectives are not evaluated but are juxtaposed to one another. This juxtaposition serves to accentuate various points of departure for future research efforts and to draw attention to the as yet small number of systematic research efforts concerned with connecting research cosmologies and with merging and transcending the boundaries of thought. Section four offers some concluding remarks and an outlook.

SECURITY, CONFLICT AND PEACE (-BUILDING) LITERATURE AND THE ANTHROPOCENE

As I will show in the following, a relatively rich body of research describes the links, interrelations and conceptual debates on conflict, peace and security with environment, climate change and, most recently, also with the Anthropocene. The literature on the security, peace and conflict and the environment goes back to the 1970s and is not easy to chart due to the wide range it covers (Floyd & Matthew, 2013: 11) and still struggles for recognition (Ide et al. 2021; Swain & Öjendal, 2018). This section takes stock of this literature along the differentiation between security, conflict and peace.

Security Research Perspectives

The literature that has linked security and environment is presented here along two key determinants that transcend the literature. These are, first, the variation of differently affected entities (referent security objects) and concepts and, second, a strong contrast between a negative and a positive evaluation of security.

Looking through the lens of different security referent objects, a dominant approach focuses on traditional state security, territoriality and military action and how environmental changes and resource scarcity, and/or climate change trigger or multiply risks for inter- or intra-state conflict or destabilize the state (see Homer-Dixon, 1994). This approach mostly rests on the realist worldview of traditional security and a negative evaluation of security policy. Also, the adverse effects of security policy that might occur within the negative security frame are important counterarguments to linking security and environment. These possible detrimental implications range from misuse of environmental policy for power politics (Neocleous, 2008), inadequate and ineffective applications of security policies to environmental issues (see Deudney, 1991; Floyd, 2008), militarization of environmental politics (Floyd, 2008), attempts of technical fixes without knowing the possible consequences, such as in the case of geoengineering (Corry, 2017) and/or apathy and inaction in the face of overwhelming threats (Pettenger, 2017).

Due to these multiple harmful effects, several scholars have highlighted the necessity to divert the focus from conflicts, war, and the negative implications towards the opportunities the link provides (Barnett, 2001). The positive perspective of security prescribes responsible actions and idealist aspirations to secure basic human needs, is often focused on alternative referent objects. The concept of human security, first introduced in the Human Development Report of the United Nations Development Program in 1994, is often at the center of the approaches of environmental security research. Consequently the focus here is placed on the question of how environmental processes affect individuals and vulnerable societies and groups (see Barnett 2001, 2007; Dalby, 2013). Research along this line investigates how global environmental change undermines development, aggravates poverty and injustices, and increases vulnerability to environmental hazards and causes conflict. (Brauch, 2009; Matthew, 2013; St. Clair, 2010).

The Anthropocene was first introduced into the literature on security by Dalby (2009), who referenced the Earth System Sciences descriptions of planetary boundaries and safe operating space (Rockström et al. 2009). In the general assessment of how it is approached by security scholars, it points out that the Anthropocene mostly figures as an "apocalyptic frame" (Pettenger, 2017: 130), threatening species, individuals and the state system (Pettenger, 2017: 120). The Earth System Sciences research on the Anthropocene is also often referenced to suggest the urgency of the matter. At the same time, the arrival

of the Anthropocene is often presented as the pivotal moment for implementing sound (counter-)action along positive guidelines. Therefore, developing a positive concept of *sustainable security* is also about escaping apathy and resignation by empowering humans and by making choices about "what kind of world we are trying to secure for future generations of humankind" (Dalby, 2013: 135). This notion is closely linked to the idea of the "good Anthropocene", informed by the hope to finally change course and kick off profound and urgent social transformations (see Dalby, 2015, 2020). Similarly informed, several security scholars propose to place ecological processes and/or the Earth System as the referent object of security along the key themes of systemic interdependence, complexity, harmony, uncertainty and sustainability (Barnett, 2007: 188). According to McDonald (2018: 155), the corresponding concept of *ecological security* is "oriented towards ecosystem resilience and with it the rights and needs of the most vulnerable across time, space, and species: impoverished populations in developing states; future generations; and other living beings". In an attempt to further contextualize security in the Anthropocene, some authors have proposed to assemble all three referent objects (state, individual vulnerable, Earth System) into one *cosmopolitan security* concept that would enable achieving *global security* (Burke, Lee-Koo & McDonalds, 2014: 8; Burke, 2016).

But the Anthropocene is also described as increasing the pressure to act and/or re-define security and also to re-visit the approaches on how to study security. SS has especially worked on how the Anthropocene challenges the very discipline, concept, and the categories of referent objects, threats and responses (see Harrington & Shearing, 2017; Hardt, 2018). Some security scholars have declared that the Anthropocene actually exceeds the boundaries of securitization logics and the conceptual capacity of security (Hardt, 2018: 70; Harrington, 2016) and might even bring "us the end of security" because "neither protection nor prevention exist anymore" (Harrington & Shearing, 2017: 34; 139). Demands for future research range from overcoming the Holocene thinking (Cudworth & Hobdon, 2011) and *Holocene security* (Harrington & Shearing, 2017) and/or focus on the theoretical development concerning (e.g., posthuman) insecurity (Cudworth & Hobden, 2017). Some security scholars show posthuman influences in their analyses. Mitchell (2016, 2017) proposes to understand harm and violence towards entire worlds in the concept of "mundicide." Also, the referent object of security is said to be put into question in the Anthropocene; thus, Mitchell (2014, 2017) and Fagan (2016) describe how, instead of state or humans, inclusive and complex assemblages of different species, ecosystems and worlds need to be considered. Harrington and Shearing (2017: 19) put this insight as follows: "Our survival and well-being are bound together with others—across species, time, and objects. This entanglement, so fundamental to the Anthropocene, is a mystery to security studies."

Generally, I observe a relatively sustained effort within SS to address and include environmental concerns and the Anthropocene.

Conflict and Peace(-building) Research Perspectives

The link between conflict and environment can be traced back to writers such as Thomas Malthus (1766-1834), who linked population growth to resources. An important research focus lies on how natural resources might cause tensions or exacerbate existing conflict (Homer-Dixon, 1994). More recent research also focuses on biodiversity loss, energy, climate change and other ecological processes that contribute and/or trigger conflict (Mach et al. 2020). One focus lies on how environmental issues lead to conflicts with

respect to state and international state systems security, while others have also focused on how the very apparatus of conflict and peace, the military sector, impacts on the environment (Dalby, 2002; Sánchez, 1998; Barnett, 2001; Barnett, 2007) and/or precisely uses environmental destruction as war strategies (Machlis & Hanson, 2009).

More recently scholars have re-approached similar questions with a special focus on climate change, resilience and vulnerability, migration, disasters and rising sea levels (see Hardt, 2018; Hardt & Scheffran, 2019 for an overview). Climate change here is either seen as linked to conflict because it acts as an "undermining factor" in human security (Barnett & Adger, 2007: 651), as a *trigger* and *stress multiplier* (Dupont, 2008: 46) and as a *threat multiplier* and/or an *increasing-security-risk* that would even lead to so-called *climate wars* (Dyer, 2009). Other researchers focus on the correlations between long-term warming and, for instance, civil wars in Africa (His & Meng, 2014), as well as on possible re-enforcing effects between climate change and conflict. Smith and Vivekananda (2007: 158), for instance, describe the vicious circle due to a "failure to adapt to climate change, worsening the rise of violent conflict and, in turn, reducing further the ability to adapt."

Peace has also been analyzed in relation to environment. This research focus was explicitly developed as a countermove to the environmental-conflict literature and gained particular momentum around the turn of the millennium (Conca, 2001; Conca & Dabelko, 2002; Conca, Carius & Dabelko, 2005). Closely intertwined with the research on conflict, the focus of this research is on how environmental issues are linked to building trust and new dimensions and forums for diplomatic relations and cooperation, as well as on the cyclic relation between peace and environment. Environmental issues are mostly described as providing an important base for conflict-resolution because it is *low politics* and can serve as a vehicle for diplomacy (Conca & Beevers, 2018: 63; Schreurs, 2009: 831). Therefore, this literature also includes other approaches that highlight the links between sustainable development and international cooperation, as being the so-called *ultimate* strategy for effectively facing the ecological challenge and to seek better futures (Werz & Hoffman, 2016; Mach et al. 2020). Buhaug (2016: 336) and Amster (2018: 74) highlight the co-dependence between peace, sustainability and climate change. On some occasions, the so-called *environmental-peace thesis* is also interpreted by scholars as uniting humans with Earth in a "peace treaty" (McClanahan & Brisman, 2015: 417).

More recently, several scholars have further engaged in assembling both research lines on peace and conflict around the concept and/or study field environmental peacebuilding (see Ide et al. 2021; Swain & Öjendal, 2018). Environmental peacebuilding, understood as a new generation of scholars (Hardt & Scheffran, 2019), is defined by Ide et al. (2021: 2-3, italics in original) as comprising "*the multiple approaches and pathways by which the management of environmental issues is integrated in and can support conflict prevention, mitigation, resolution and recovery*," which unfolds along three dimensions, including security, livelihoods and economy, and politics and social relations. A crucial debate within this body of research remains focused on scrutinizing the link between climate change and conflict and peace (Buhaug et al. 2014: 396). Another debate turns around the geographically limited focus on certain regions, mainly Africa in contrast to, for example, Asia or Oceania when the links between climate change and conflict are investigated (Adams et al. 2018: 200). According to Adams et al. (2018: 202) this recurrent sampling bias of the climate conflict research field is due to geopolitical interest or data availability, which in turn leads to overrepresentation of certain regions that, as a consequence, are "stigmatized as inherently violent and unable to cope with climate change peacefully." Another concern is that environmental degradation, resource scarcity, climate change etc. are often approached as a de-politized and natural

phenomenon (Hardt & Scheffran, 2019; Ide, 2019) that excludes questions of responsibility and accountability and that requires merely technocratic solutions and responses (Aggestam, 2018: 104-105).

The described future research necessities of environmental peacebuilding are, according to Ide et al. (2021), bottom-up approaches; gender; conflict-sensitive-programming; use of big data and frontier technology, monitoring and evaluation. In addition, the specific proposals on presenting practical tools and on how to include climate change and environmental peacebuilding within the practice of conflict prevention and peacebuilding (Bazirake, 2013) is another future concern of many researchers. Proposals on how to practically include climate change in peacebuilding are, for instance, the demand to include broader time frames on peacebuilding, which will be beneficial both for the people in the conflict situation and for the donors (Matthew, 2014; 2018; Milante, 2017), but also critically revising the environmental impact of the very sector of peacebuilding (Swain & Öjendal, 2018: 10). The simultaneity of moments and situations of peace, cooperation and conflict also remain a future task (Conca & Beevers, 2018: 69). In other words, a more differentiated approach to measure and evaluate certain situations with respect to different levels and dimensions of peace and conflict are necessary to develop. Furthermore, the present incapacity to include actors and causes of seemingly distant (but interrelated) geographies, complex interrelations (Orsini et al. 2019) and temporalities into the frameworks of a conflict and peace remain a future challenge (Hardt & Scheffran, 2019).

It calls to attention that the main focus within this literature is on climate change (Sharifi et al. 2020). The term *Anthropocene*, on the other hand, is almost entirely absent from this research. Thus, it does not figure along some of the recent and central publications on environmental peacebuilding (see Ide et al. 2021; Mach et al, 2020; Swain & Öjendal, 2018). Where referenced, it is mostly conceived as a mere description of external context without major implications on the concepts of conflict and/or peace (see Chandler, 2019; Ide, 2019), mentioned as a future research necessity (Hardt & Scheffran, 2019: 12), or as a context that clearly puts into question the liberal project (see Chandler, 2012; Orsini, et al. 2019; Bargués-Pedreny, this special issue).

In light of these research insights, it seems that, in contrast to SS, PACS have some difficulties to address and include the Anthropocene within its research agenda. Moreover, it is surprising that the usually closely related concepts at the heart of IR, security, conflict and peace are very little connected when it comes to the new context of the Anthropocene. Future research will have to inquire into the possible reasons for this and also establish a systematic, informed exchange between SS and PACS on the Anthropocene. Research on these almost invisible and until today little problematized boundaries between the study fields would also help to avoid duplicating certain research questions, as it has often been observed and outlined in the field (Floyd, 2008; Hardt, 2018; Hardt & Scheffran, 2019; Trombetta, 2008).

ANTHROPOCENE SCHOLARSHIPS, SECURITY, PEACE AND CONFLICT

In this section, I explore two of the main bodies of scientific knowledge that, in spite of being based on entirely different epistemological and ontological approaches, have worked on the Anthropocene and the descriptions of the human-nature entangled worlds. The first is the Earth System Sciences (ESS), the classical natural sciences approach that aims to acquire and integrate meta-data at a planetary level, and which first introduced the geological era of the Anthropocene (Crutzen, 2001; Steffen et al., 2020). The second

comprises the philosophical work categorized here as New Materialism/Posthumanism, mainly informed by feminist, queer and decolonized studies (see also Mújika, this special issue). This approach has drawn on the idea of the ESS Anthropocene concept while developing a sort of philosophical counter-project to the ESS Anthropocene. Both disciplinary fields usually do not converge and while the ESS scholars Zalasiewicz et al. (2021) have recently acknowledged the important parallel elaboration of philosophical work on their central research object, future ESS research is projected based on maintaining the disciplinary boundaries. Only very few approaches exist that try to bridge both disciplines and overcome the respective boundaries of thought cross-cutting the social and natural sciences (see Niewöhner, 2021 for an exception).

In what follows, I present a first attempt to draw out the existing boundaries of thought between the two by presenting a combination of several key features and by comparing the partially opposed cosmologies from the ESS with New Materialism/Posthumanism. For this combined approach, I propose the term *Anthropocene scholarships*. As such, this investigation also shows the key concerns and study objects from both bodies of knowledge on the Anthropocene. In a second approach, I provide a first overview of some of the most visible approaches that these body of work provide in reference to the terms and new interpretations of conflict, peace and security.

Anthropocene Cosmologies, Contexts and Frames

The Anthropocene, as formulated by the Earth System Sciences (Crutzen, 2001) and interpreted by philosopher Bruno Latour as the arrival of the "terrestrial" (2018), carries new frames and contexts that range from the planetary scale, bound to nine systemic variables of the Earth System (Rockström et al. 2009), to the trajectories of the planet towards a locked-in Hothouse Earth (Steffen et al. 2018), and down to the situated, local and material power of matter/compost (Haraway, 2016). The following investigation combines the key concerns of Anthropocene descriptions from both bodies of knowledge along scale, time and agency, some of which will be evoked in the following.

In the face of the threatening scenarios of a Hothouse Earth (Steffen et al. 2016), Earth System Sciences insist on the necessity to re-gain control and take responsibility and navigate Earth into a safe operating space for humans along the Planetary Boundaries (Rockström et al. 2009). The central agents are humans who need to become active stewards of the Earth. In Rockström et al.'s (2009: 21) words, "Humanity thus needs to become an active steward of all planetary boundaries […] in order to avoid risk of disastrous long-term social and environmental disruption." This is how the Anthropocene—akin to some approaches in the environmental security literature—is evaluated as an opportunity "to channel the transformative and creative potentials of human society towards desirable and novel futures…" that unites humanity in the effort to construct desirable futures for humans (Bai et al. 2015: 10) and a "a normative guide to action" (Baskin, 2014: 3).

Some New Materialists'/Posthumanists' approaches to agency in the Anthropocene also point to the opportunity implied by the fact that the Anthropocene, for the first time, unites humanity into a "we," even though differentiated into a "we-who-are-in-this-together," which is seen as inducing hope and as generating energy and motivation towards change (Connolly, 2017: 121; Braidotti, 2020: 258). At the same time, the posthumanist approach to agency in the Anthropocene deeply and explicitly challenges the ESS description of a human agent capable of managing and becoming steward of the Earth. Much to the contrary, posthumanist scholars interpret the Anthropocene as

impervious to response, solution and control. Instead, New Materialism/Posthumanism focus on agency ranges from the inter-species focus, as more-than-human (Tsing, Mathews & Bubandt, 2019) or the dissolution of abstraction of the human body (Haraway, 2016). Following the declared aim to overcome anthropocentrism (Braidotti, 2013, 2016a, 2016b, 2020), the New Materialism/Posthumanism reading of the Anthropocene criticizes socio-centrism (Connolly, 2017: 184) and, therefore, dissolves the scales of politics and of a security understanding tied to the referent objects of state, vulnerable groups and individuals.

The time frames of the Anthropocene presented by ESS correspond to a specific moment in time, in which humans have acquired the geological force measurable. In the Anthropocene, "*human modification of natural systems has become predominant*" (SQS, 2009). Contrary to this reading, the New Materialism/Posthumanism approach to the Anthropocene consists in the attempt to become aware of the persistent basic assumption of humans as being part of nature (Haraway, 2016; Morton, 2013). Furthermore, the differentiations between an external and internal, and the human-nature dualism need to be overcome and developed further the understanding of an entangled worlds (Morton, 2013). Notions of deep time and the contextualization of certain events with respect to significantly longer (geological) timescales and futures in ESS strongly contrasts with the New Materialism/Posthumanism approach. The latter argue for the need to affirm the seemingly frozen and ever-enduring situation and to shift the focus from the future to the unmediated, lived present and to thereby "make the Anthropocene as short/thin as possible" (Haraway, 2016: 160). Colebrook (2014: 58) further sets out that "[A]s long we calculate the future as one of sustaining, maintaining, adapting and rendering ourselves viable… there would be no future for us other than an eventual, barely lived petering out. If, however, we entertained the erasure of the human… then there might be a future."

As indicated in the previous section, several SS scholars have, to a different extent and in relation to different questions, referred to the conglomerations of socio-ecological, deep time frames, responsibility and control versus end of humanity and extinctions. Also, the discipline of IR has fostered debate around these seemingly IR-unfriendly Anthropocene contexts and frames (see Castro & Saramago, 2020; Chandler et al. 2021; Dalby, 2020; Kavalski, 2020). The Anthropocene scholarships, however, do not treat the central concerns, research objects, theories or key concepts of IR, such as politics, the system of states and international institutions, territorial borders, cultures, religion, or normative accounts. It seems that within the Anthropocene –which by definition is produced by humans- these processes and questions are not considered as crucial either. Another possible reason for this lack of interest is that these research objects and processes are simply left to other disciplines to explore (see Zalasiewicz et al. 2021), but this question needs to be further investigated. In the case of New Materialism/Posthumanism, a rejection of the traditional IR categories, approaches and epistemologies might be due to the fact that they are held to have contributed to causing the Anthropocene and are therefore not useful in searching for urgently needed transformation (Braidotti, 2016a, 2016b). But on this, too, future research remains necessary.

Anthropocene Scholarship Perspectives on Securities, Conflict and Peace

The following analysis shows that the central categories of IR, SS and PACS namely *security*, *conflict* and *peace* do not receive central interests, neither from ESS nor from New Materialism/Posthumanism. At the same time, totally different meanings of

survival, the existential and violence are found. I will analyze the fields separately on this point.

Perusing the body of work concerning the references or approaches to security, I find that the entire literature is dominated by the contrast between descriptions of apocalyptic scenarios of the Anthropocene and notions of the existential and future transformations. The Earth System Sciences describe the existential threat and the possible end of humankind, for which the Anthropocene is supposed to act as an "awakening call" (Leinfelder et al. 2012: 13). The following quote from an Earth System Scientist illustrates this emphasis on the threatened existence and corresponding necessity to act: "As humanity moves more deeply into the unknown world of the Anthropocene, the question arises as to whether our society will even survive this transition, or will collapse as many other civilizations have done in the past" (Steffen, 2011: 32). The "habitability of the planet for humans" is related to temperature (Steffen et al. 2018: 5), and the ongoing trends of warming could possibly result in tipping cascades, which could turn into an "existential threat to civilization" (Lenton et al. 2019: 595). Further specification of existential threat mostly relies on diffuse imaginaries of disaster, irreversibility, risk, fear, mass extinction and collapse and is rarely specified in terms of consequence (Steffen, 2011: 32). In accordance, a new understanding of security from an ESS perspective seems to be presuppose a *safe operating space* for humanity along thresholds and tipping points (Rockström et al. 2009). Moving the Earth System back into a "Holocene-like state" based on scientific understanding (Steffen, 2016: 24) is the central aim and could be almost interpreted as a new type of security politics. Rockström et al. (2009: 23) describe this notion of security, which seems relatively similar to the ecological security concept (see McDonald, 2018), as follows:

> There is little doubt, however, that the complexities of interconnected slow and fast processes and feedbacks in the Earth System provide humanity with a challenging paradox. On the one hand, these dynamics underpin the resilience that enables planet Earth to stay within a state conducive to human development. On the other hand, they lull us into a false sense of security because incremental change can lead to the unexpected crossing of thresholds that drive the Earth System, or significant subsystems, abruptly into states deleterious or even catastrophic to human well-being. The concept of planetary boundaries provides a framework for humanity to operate within this paradox.

Browsing the Earth System Sciences further on the search for references and descriptions that allude to peace and/or conflict, one finds several descriptions on climate change, which are similar to those advanced in the environmental peace and conflict literature. The IPCC (2014: 8) report, for instance, describes the cyclic relation of how "Violent conflict increases vulnerability to climate change (*medium evidence*, *high agreement*)." On the other hand, "Climate change can indirectly increase risks of violent conflicts in the form of civil war and inter-group violence by amplifying well-documented drivers of these conflicts such as poverty and economic shocks (*medium confidence*)." (IPCC, 2014: 20; see also IPCC, 2019: 18, italics in original). Also, references to the links between climate politics and international cooperation are highlighted. For example, the IPCC report (2018: 31, italics in original) holds that

> International cooperation is a critical enabler for developing countries and vulnerable regions to strengthen their action for the implementation of 1.5°C-consistent climate responses, including through enhancing access to finance and technology and enhancing domestic capacities, taking into account national and local circumstances and needs (*high confidence*).

In any case, *conflict* is not attributed a central role in this literature. In direct relation to the term Anthropocene, *conflict* is only mentioned as an additional concern (see e.g. Folke et al. 2021) and *security* is entirely absent (see e.g. Lenton et al. 2019; Steffen et al. 2015; Steffen et al. 2018). Moreover, in the ESS literature, the term *peace* is not mentioned at all in some of the most important publications (see Folke et al. 2021; Lenton et al. 2019; Steffen et al. 2015, 2018) neither in the IPCC summaries (see IPCC, 2014, 2018, 2019).

The New Materialism/Posthumanism research that treats the Anthropocene with references to conflict, peace and security are also relatively scarce. Seemingly, these concepts do not play an important role (see absence of the term in Braidotti, 2019). A major reason for this might be that most scholars in this area are deeply skeptical about the very ideas of safety, security, etc... Chandler (2018: 127) explains the lack of interest in the concepts of *peace* and *conflict* by claiming that "the modernist binary of peace and conflict" no "longer appears useful for seeing the world, in fact, it becomes a barrier to seeing the world as it actually is in reality" in the Anthropocene. Future inquiries into these questions are necessary.

An exception seems to be philosophical description offered by Peter Sloterdijk (2016: 40), who frames the Anthropocene as a *war of all against all*. Similarly, Latour (2004, 2018) explains that Modernity sets the stage for a new era of destruction. In general, it is worth highlighting that the references to the Anthropocene are mostly underpinned – akin to the environmental security literature- by a sense of tragedy and the necessity for paradigmatic change of action. Thus, Braidotti (2016a: 258) states that "The literature of anxiety about the future of both our species and of our humanist culture is by now an established genre as shown by the quantity of recent scholarship on the environmental crises, climate change and the threat of extinction of our and of other species […]." In the face of this tragedy and the corresponding necessity to re-visit the new world revealed by the Anthropocene paradigm, the Posthumanist project calls for "affirmation," which according to Braidotti (2013: 195, 2016b: 51-52) consists in transmuting "negative passions into productive and sustainable praxis" and thereby "actively and collectively work toward a refusal of horror and violence […] and to turn thus into the construction of affirmative alternatives." Braidotti (2013: 195) analyzes this new world and the process of becoming aware of the tragedy, which at the same time presents "a unique opportunity for humanity to re-invent itself affirmatively, through creativity and empowering ethical relations, and not only negatively, through vulnerability and fear. It is a chance to identify opportunities for resistance and empowerment on a planetary scale." Central tools that will lead to a profound transformation consist, according to the Posthumanists, in the search for "unconscious" and creative ways of "dreaming the future" (Braidotti, 2016a: 261), in a politics of swarming (Connolly, 2017) or in an attempt to think! harder (Haraway, 2016). In other words, the device here is to put into practice a philosophical approach that helps to cope.

This literature review shows that traditional and key research objects and concerns from IR have received very little attention from Anthropocene scholarships and that the research connecting these different domains still remains to be conducted also in the fields ESS and New Materialism/Posthumanism.

CONCLUDING REMARKS ON BOUNDARIES OF THOUGHT AND RESEARCH

This article took stock of different research perspectives from three disciplines, investigating the ways in which (the relation between) peace, conflict, security and the

Anthropocene are approached. The aim of this analysis was to critically examine existing approaches and to prepare future research on Anthropocene thinking.

In the first investigation, which explored the IR literature, I argued that, although the Anthropocene has been addressed from security perspectives, the peace and conflict study focus on the Anthropocene remains relatively underdeveloped. The boundaries between these strongly intertwined study fields should be tackled. An exchange on existing and possibly converging research between PACS and SS on the Anthropocene will be an important future task.

In the second investigation, I examined how Earth System Sciences and New Materialism/Posthumanism approaches to the Anthropocene and human-nature relations produce a range of important problems that, if taken seriously, fundamentally challenge Peace and Conflict and Security and IR, in particular with regard to aspects of time, agency and scale. These were presented by means of an analysis that combined both cosmologies into Anthropocene scholarships. The boundaries of thought between ESS and New Materialism/Posthumanism descriptions also remains a future important task, especially on the way to developing Anthropocene Studies further. The research has also shown that while some references or to conflict, peace and security adjacent concepts can be found within the Anthropocene scholarships that could inform SS and PACS, the key IR concepts (security, peace and conflict) are seemingly not a key interest. Future research is needed here, too.

Altogether, this research showed that there are few interconnections and that, with regard to these central questions and topics of the Anthropocene, conflict, peace and security, research often remains within the limits of the disciplinary boundaries of the respective research field and IR. SS seem to provide the most advanced scholarship in terms of addressing these crucial questions and aiming to further develop the field. Tackling those boundaries of thought and searching for connections between the disciplines is an important future research task (see Niewöhner, 2021). Furthermore, a systematic analysis that locates security, conflict and peace and the Anthropocene, bringing together insights and drawing on the already existing bodies of research from the three disciplines, remains an important and formidable task that, by developing the as yet relatively limited body of research on the matter, could contribute important impulses to all three fields. Another direction of research that could help to develop Anthropocene thinking could focus on two trends that are common to all the bodies of knowledge analzyed here: on the one and, the opposition between apocalyptic conceptions and transformative change towards better futures and, on the other, the attempts to think human beings in relation to the Earth/the planetary.

Overall, one of the main tasks consists in re-focusing the discussions of individual disciplinary futures so as to engage more explicitly with the question of how these different bodies of knowledge and the foundations of scientific knowledge could and/or should meet and be bridged, and of how to deal with the boundaries of thought in developing Anthropocene thinking. As this research has showed, the necessity to bridge the divide of social and natural sciences within the new living context of a human-made geological era (Hamilton, Bonneuil & Gemenne, 2015) still lies ahead and, instead of further focusing on how to fix the respective disciplines, the focus should also take into account the boundaries of thought between and within disciplines and study fields on and around the Anthropocene.

ABOUT THE AUTHOR:

Judith Nora Hardt es investigadora postdoctoral en el Zentrum March Bloch (Berlín), donde trabaja en temas sobre teoría de las Relaciones Internacionales y seguridad climática. E-mail: judith.hardt@cmb.hu-berlin.de

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