Part I: **Space**

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Global Narrative Environments, or the Global Discourse of Space in the Contemporary Novel

One cannot really comprehend the idea of the "global" without thinking about space. This is clear with the phenomenon of globalisation, in which capitalism encompasses the whole world. In this sense, to understand the ways in which we have developed our notions of the global, we need to review the particularities of space and scale that make it a distinguishable category. Furthermore, our interest in the global has run parallel to the considerable space theorization in critical geography over the past few decades, the impact of which has given rise to the term "spatial turn" in several disciplines. It seems that the idea of "the global" has cross-fed from our contemporary notions of space. Nowadays, part of the flexibility enjoyed by the broad concept of the "global" is due to our more complex ideas of space, conceived from a multi-dimensional standpoint that superposes physical space, movement and change, and spatial imagination, in the work of scholars such as Henri Lefebvre (1974), Michel de Certeau (1980), Edward Soja (1996), Doris Massey (2005), David Harvey (2006), and Edward Casey (2013).

The parallel developments in the conceptualization of space and globality call for a broader understanding of their material relations as well as of theoretical approaches to global and spatial research. Even in literature, since notions of globality appeal to a planetary space the dimensions of which embrace almost the entire spatial limits of known territory and phenomena, thinking from a global perspective often feels too broad and general when not done in relation to the local (Heise 2008). Globality has also attracted strong criticism when considered as intimately related to economic globalisation (Habjan and Imlinger 2016; Apter 2013). However, concern about space and globality does not necessarily involve generalising or being complicit with globalisation. If we operate at a global level, commercially, politically, culturally, and even legally, then these practices deserve to be studied with tools that we are struggling to produce and adjust to a global scale. Perhaps more importantly, we generate ideas of the global partly triggered by these practices, partly to explain contextual circumstances that we perceive as worldwide,

Funding: This chapter was possible thanks to the grant Programa Ramón y Cajal (RYC2019-028186 / AEI / 10.13039/501100011033) in a contract funded by the Ministerio de Ciencia e Innovación, the Agencia Estatal de Investigación, the Universitat de les Illes Balears and the European Social Fund ("The European Social Fund Invests in your Future").

https://doi.org/10.1515/9783110740301-002

such as, for example, transnational neoliberal capitalism or a human-driven new geological era. From the standpoint of this chapter, the relationship between space and globality needs to be considered from the dual dimensions of fact and discourse, a blend defining our contemporary spatial approach. I will do so from the point of view of contemporary novels and literary studies.

Among the many possibilities in thinking about space from a global perspective in literature, in this chapter I distinguish what I call "global environments," spaces which are clearly conceived and work in a manner that can hardly be considered in terms other than global, such as oceans, outer space, deserts, highlands or even the planet itself. While there are many angles from which to consider "global environments," I propose looking at them by considering the way that contemporary novels contribute to making these spaces global, producing what I specifically call "global narrative environments." These literary environments help shape larger discourses concerned with the relationships between space and globality, such as Ecocriticism and the Anthropocene. In this chapter I focus on the relations between the material, social, and conceptual dimensions proposed by the spatial turn that configure these environments as global spaces in literature. Taking this perspective I offer a tentative definition of "global narrative environment," and delve into the case of oceans as paradigmatic and their relation to the discourse of the Anthropocene. Finally, I use the example of Frank Schätzing's novel *The Swarm* (2004) to illustrate the construction of oceans as global literary spaces that engage with and participate in global discourse.

1 Global Environments

Contemporary novels adopting a global approach highlight certain spaces that are difficult to imagine from a non-global perspective. These can be termed "global environments" and, when studied as a product of a narrative, understood as "global narrative environments." That is, "global environments" refer to spaces that exist independently of literature and that are managed from an international perspective. As we will see, this kind of environment is described and built from various discourses, from anthropological and legal to literary ones. I will focus on the nature of these global spaces as well as on their narrative construction.

The spatial turn has promoted a fruitful understanding of space that has involved at least two profound changes: firstly, that space is intimately related to time, since we cannot contemplate space without movement (for example, Lefebvre 1974, Certeau 1980, Harvey 2006) and without a historical perspective, which is also a socioeconomic and political perspective (for example, Massey

2005). Spaces are used by people, they change, and are historical. Secondly, space is influenced by our imagination. We imagine and conceive space, which heavily determines and justifies how we actually use it socially (Soja 1996).

In different disciplines and from several points of view, scholars have approached spaces that do not easily adjust to a national scale or definition. The best-known formulation is the anthropologist Marc Augé's (1992) concept of "non-places," spaces that prevent us from developing rooted identities that can serve local, national, and self-identification purposes. As Augé explains, non-places like supermarkets, highways, hotels, and airports can be understood as globalisation products that resist identification through homogenization and anonymization processes. These are identical, interchangeable, spaces everywhere and thus capable of producing a sense of the global. However, Augé's spaces are built spaces. Then, what happens to wide open, mostly unbuilt spaces with transnational regulations and uses? I am interested here in large less-built environments such as oceans, deserts, and the poles, which are understood as global and have hardly been considered in literary studies.

I propose here to identify these unbuilt open spaces as "global environments," a new concept that partly stems from some of the specificities drawn by Gilles Deleuze and Felix Guattari's (1980) notion of "smooth spaces," Lauren Benton's (2009) "anomalous legal spaces," and the historical "global commons." From a philosophical perspective, Deleuze and Guattari distinguished between "striated space" and "smooth space" by associating the regulated, grid space of the former with the state structures, and the latter with a changing space that is difficult to inhabit and territorialize, fluid and characterised by constant movement. Deleuze and Guattari's privileged smooth space was the desert, which resists settlement and is a changing landscape, features that are common in global environments, as we will see.

In her book *A Search for Sovereignty: Law and Geography in European Empires, 1400–1900*, Lauren Benton (2009) also discusses the desert. While considering that imagination of the desert has drawn on non-historicity and abstraction, Benton traces the political uses of these imaginations for gaining power and collecting profits. Her argument echoes Doris Massey's, also considering the necessary overlap of political and economic history in our conception of space. Lauren Benton argues that deserts, along with oceans, highlands, swamps, and rivers are peculiar spaces because they have been internationally contested throughout history – mostly by modern European colonial powers. Since these spaces have been the object of changing and disputed legislation, Benton calls them "anomalous legal spaces." She traces the international legal history of the ocean as her most paradigmatic case.

The peculiar nature of vast natural spaces whose physical conditions resist territorialization, but which hold valuable goods that make them heavily contested, has long been socially and legally identified as special. Indeed, this is the origin of the category of "global commons," which today includes the high seas, the seabed, Antarctica, the atmosphere, and outer space. While it does not have a juridical definition, the category "global commons" applies to those spaces on the planet located outside national state jurisdiction whose goods can be freely exploited (Juste Ruiz 2018, 135). They are also object of "human common interest" or "human common concern" (Juste Ruiz 2018, 140), meaning that their regulation is not only internationally established in treaties such as the United Nations Convention of the Law of the Sea (1982) that rules oceans, but that nation states compromise to ensure that their legislation aligns with the internationally established provisions that guarantee the preservation of common goods and convened control of resource exploitation.[1]

Stemming from the problems addressed by the notions of "smooth space," "anomalous legal spaces," and "global commons," I suggest considering these spaces as "global environments." I propose that "global environments" are wide, open spaces that are difficult to regulate, inhabit and settle due to their physical nature. They are often used as transition spaces and for resource exploitation, as well as they are internationally contested, have socially and legally been established as anomalous, and usually fall under the natural law principles of free collective access and benefit. Among these, we can include the designated "global commons," which are oceans, airspace, outer space, and Antarctica and also other contested vast natural spaces like the poles, deserts, jungles, swamps, and highlands. In this list, we could include planet Earth, given its strong force in global environmental concerns such as the Anthropocene.

These environments exist independently from our conception of them, but their global condition results from a blend of the material, social, and imaginary perspectives that our renewed ideas of space endow them with. This makes us aware not only of their peculiar nature but also of the ways in which their features

1 Juste Ruiz distinguishes between three regulation regimes; one that defines the global commons historically as free access goods, another that focuses on common interest, such as animal species, and another that focuses on human world heritage, which is less place-specific and whose regime applies to the seabed. As Juste Ruiz explains, this combination of definitions has grown while the interest for globally considered spaces and goods requiring international protection and management has made the understanding of global commons complex in their legal interpretation. Added to this problem, there are agreements and shared state and international management issues. For a full account of the regulation of global commons, see Vogler (1995), Buck (1998), and Joyner (2012).

are being mobilised to produce a perspective that deliberately presents these spaces as global.

2 Global Narrative Environments

Literature strongly contributes to the building of global imaginaries. We can mostly see that in what we call the "global novel" (i.e. Morace 2014, Haley 2015, Hoyos 2015, Rosen 2017, Ganguly "The Global" 2020), the "world novel" (Irr 2011, Coletti 2011), or the "planetary novel" (Keith 2018, Taylor 2016), a diverse contemporary genre that deliberately assumes a global approach through concerns such as cosmopolitanism, global violence, hyperconnectivity, new affects, translation and multilingualism, and the planetary (Rotger and Puxan-Oliva 2021). Drawing on diverse linguistic and cultural traditions, these novels elaborate global concerns through experimenting with narrative form, building on narrative techniques such as multi-strand plot, polyphony and generic spaces, and borrowing from genres such as science fiction, the realist novel, and crime fiction. Through these narratives, they build global imageries and participate in global discourses. In this effort to perceive the stories from a world perspective, global novels are a suitable genre in the construction of global spaces such as the environments I discuss here.

The narrative use of space in literature concerned with the global would deserve further exploration, not only with regard to how space is elaborated through a global perspective in a thematic, cultural dimension, but also with regard to how this is formally constructed. Narrative theory has long been unconcerned with the sociocultural dimension of narrative technique. To redress this tendency, scholars such as Susan S. Lanser (1992), Erin James (2015), Greta Olson (2018), and Sarah Copland (2018) have introduced gender, environmental, political, and racial perspectives to narratology to understand how literature creates discourse through narrative technique. Specifically, Marie-Laure Ryan, Kenneth Foote, and Maoz Azaryahu (2016) have initiated research on narrative space in conjunction with critical geography by analysing how space is narrated, for example, in museums or in the street, inscribed in signs, stories, or explanations. A few scholars, like Jeremy Rosen (2017), Ursula Heise (2008), Erin James (2020), and Adam Trexler (2015), have considered global space from a cultural dimension together with narrative technique. James proposes that a narrative theory preoccupied with the Anthropocene should correct the "lack of engagement with narrative theory within the environmental humanities" and the "almost total absence of considerations of the environment in narrative

studies" (2020, 184). Bringing together narrative technique and global spaces, Rosen (2017) has proposed the idea of "generic space" as frequent in global novels by Haruki Murakami or David Mitchell. Generic spaces are spaces shaped by popular ideas disseminated in media, that is, a country like Japan would be represented in a novel through other exported cultural products such as films and comic books. In a larger argument, in *Sense of Place, Sense of the Planet*, Ursula Heise (2008) proposed "eco-cosmopolitanism" as a literary way of developing a type of space in literature that sees local, place-specific environmental concerns as globally connected. These formulations guide our study of space from a blended perspective that seeks to reveal how literature produces a discourse on global space by articulating the social and cultural contexts with their linguistic formulation. Therefore, speaking in terms of "narrative environments" instead of the narratologically established "narrative setting" reflects that the discourse and contextual circumstances are inextricable in the elaboration of space in narrative.[2]

The concept of "global environments" is useful in thinking about the production of space in contemporary literature beyond national borders and about current concerns that are linked to these environments. Global environments such as deserts, seas, or swamps provide literature with a fruitful ground to discuss contemporary problems that are perceived as global. Examples abound. To mention a few, in J. M. Coetzee's *Foe* (1986), the sea is perceived as a realist setting and repository of colonial enterprises in a rewriting of *Robinson Crusoe* that progressively shows the ocean as an agent space that confuses an enigmatic narrative voice with the material liquidity of seawater. In this use of oceanic space, the separation between non-human matter and humankind is no longer visible, transforming discourse in a non-mimetic narrative similar to what happens at the end of Franz Schätzing's *The Swarm* (2006 [2004]), as we will see. In these novels, the relations between species are blurred so as to create a post-human, ecocentric view of the ocean that is currently being proposed for our understanding and uses of it. In a very different manner, the Chilean Roberto Ampuero's *El alemán de Atacama* (1996), uses crime fiction conventions to portray the Atacama Desert as the favoured site for international toxic waste disposal, since chemicals can be easily buried unnoticed in the vast uninhabited territory and illegal business can operate freely with the complicity of a corrupt government. Novels like these deploy global environments to discuss global social and political problems, while they strongly participate in globalising space. In this sense, we can think about "global narrative environments," that is, the use of global environments in narrative.

2 I explored this argument in Puxan-Oliva 2018 and 2023.

3 Oceans as Global Environments

Oceans are a paradigmatic example of "global environments." Interest in oceanic studies has grown enormously in the past decades in fields like critical and political geography, political and ecological economics, anthropology, and literary studies. This is in part due to the fact that oceans have become a focus for rapid industrial development at sea, in what is known as the "blue economy" and "blue growth," a race for sea profits made possible due to great technological advances that enable food production as well as a greater extraction of mineral and biological resources. The aquaculture revolution is at the core of the blue economy, a new agriculture that produces fish and seafood in enormous quantities with devastating effects on the environment due to the release of toxic chemicals that destroy coastal biodiversity (Mallin and Barbesgaard 2020; Bennett et al. 2021). New mining exploitation methods such as deep-sea fracking, and new areas such as the increasingly melting Arctic Ocean have also heightened attention and alarm about oceans. Since oceans are progressively understood as prospective economic expansion areas, environmental preoccupation about their state has grown. Attention to this socioeconomic phenomenon has renewed our cultural interest in oceans, as scholars have shown that values, imagination, and ideas about the ocean profoundly condition our practices at sea, as well as they help justify them.

Geographers like Philip Steinberg (2001), Jon Anderson and Kimberley Peters (2014), and John Hannigan (2016) have not only drawn attention to oceans as complex spaces but have also transformed our understanding of them. This recent scholarship on critical geography proposes that oceans should be viewed as a multi-layered social construction (Steinberg 2001; Anderson and Peters 2014). In *The Social Construction of the Ocean* (2001), Steinberg argues that geophysical oceanographic conditions have historically triggered different, sometimes contradictory imaginations of the sea as a space of governability and power control, and as a huge non-possessable space. Steinberg discusses the ways in which the sea has been considered void, a transit space as well as a geopolitical space, the potential development of which involves being able to govern it, a project that has accompanied the unfolding of modern and global capitalism. In *Contesting the Arctic: Politics and Imaginaries in the Circumpolar North* (2015), Steinberg, Tasch, and Gerhardt study the Arctic Ocean case, where they contrast the different perspectives that groups like the gas industry, environmental associations, indigenous Inuit populations, or Danish, Russian, Canadian, and US policy makers have over the Arctic Ocean and the different discursive views they produce in order to support their vision of its future management and their own interests. Steinberg, Tasch, and Gerhardt proposed the concept of "ocean imaginaries": perspectives

that grew out of various ideas of the Arctic, which envisioned the region variously as a "terra nullius," a "resource frontier," an "indigenous statehood," or a "normal ocean." Their project highlights the overlapping imaginaries that underpin present politics and expectations for the future of the Arctic Ocean, and their specific contexts in a broader international perspective, articulating their conceptualization and management on local and global scales.

Building on Steinberg's claims, Hannigan's 2016 *The Geopolitics of Deep Oceans* describes the multiple conceptions of deep oceans, centring on the historical, international challenges that various social imageries have posed to governing deep oceans. The fact that oceans are considered collective goods has influenced the perception that oceans should be ruled globally. As Hannigan points out:

> The United Nations Convention on the Law of the Sea (LOSC) [UNCLOS]. The LOSC is the centrepiece of a powerful and continuing narrative about deep-sea geopolitics that I have called 'Governing the Abyss.' According to this storyline, the only way to bring order and protection to an unregulated maritime frontier is to adopt a universal legal regime, whereby the high seas and the deep oceans come under tighter supervision and control of the nations of the world. (2016, 52)

The high seas and deep sea are "grey areas" (Hannigan 2016, 67), since coastal states have no regulatory power and international institutions such as "the International Seabed Authority responsible for regulating scientific research on the ocean bottom are yet to be fully defined" (Hannigan 2016, 67). Another problem in sea governance is the overlap of international institutions, parallel jurisdictions and "treaty congestion," which hinder their international management (Hannigan 2016, 73). As scholars like Benton, Steinberg and Hannigan show, the ocean can only really be conceived transnationally, since even coastal waters are agreed upon in international treaties, while the high seas and seabed remain as global commons, subject to contested, complex, international efforts to establish agreements that fit with our global conception of oceans. What these studies leave clear is that the socioeconomic uses of the ocean in an increasingly global development of neoliberal capitalism and its environmental damage threatening oceanic sustainability have strongly reinforced our global conception of oceans. In fact, our present discourses dealing both with the international regulation of global oceanic environments as well as with their sustainability are key factors in the new directions in ocean globalisation.

Indeed, oceans are not only relevant from a global perspective as a space that has a historically established legal and environmental consideration surpassing national borders. Their global dimension is today greatly emphasised by the devastating effects that we predict climate change will have on the oceans. The accelerated environmental damage to the oceans is a cornerstone in the

definition of the Anthropocene: a geological era in which a human footprint impacts upon the entire Earth and seriously threatens its sustainability. In 2000, Paul J. Crutzen and Eugene F. Stoermer provocatively proposed that we are living in a new geological era, the Anthropocene. In an oft-quoted seminal article published in *Nature* in 2002, Crutzen stated:

> Because of these anthropogenic emissions of carbon dioxide, global climate may depart significantly from natural behaviour for many millennia to come. It seems appropriate to assign the term "Anthropocene" to the present, in many ways human-dominated, geological epoch, supplementing the Holocene – the warm period of the past 10–12 millennia. The Anthropocene could be said to have started in the latter part of the eighteenth century, when analyses of the air trapped in polar ice showed the beginning of growing global concentrations of carbon dioxide and methane. (2002, 23)

Whereas the scientific grounding for the Anthropocene as a geological era is still under debate, global climate change viewed through this new geological era has strengthened what Ursula Heise called the "sense of planet" (Heise 2008). As Dipesh Chakrabarty suggests in his well-read essay "The Climate of History: Four Theses," the early 2000s were a turning point in global climate change awareness:

> The situation changed in the 2000s when the warnings became dire, and the signs of the crisis – such as the drought in Australia, frequent cyclones and brush fires, crop failures in many parts of the world, the melting of Himalayan and other mountain glaciers and of the polar icecaps, and the increasing acidity of the seas and the damage to the food chain – became politically and economically inescapable. Added to this were growing concerns, voiced by many about the rapid destruction of other species and about the global footprint of a human population poised to pass the nine billion mark by 2050. (2009, 199)

The new environmental dimension of globality conceived from a geological perspective heavily shook the social-sciences globalisation theories, since it affected the earlier perception of global space as heavily linked to the globalisation of capitalism and the social and economic development of a network society (Castells 1996). Chakrabarty explores the profound unrest that global climate change had on the scaling and perspective of historical methods:

> As the crisis gathered momentum in the last few years, I realized that all my readings in theories of globalization, Marxist analysis of capital, subaltern studies, and postcolonial criticism over the last twenty-five years, while enormously useful in studying globalization, had not really prepared me for making sense of this planetary conjuncture within which humanity finds itself today. (2009, 199)

For Chakrabarty, experience from the past and present is the basis for historical understanding. To think about globality from the non-human scale of geological climate change creates the paradox that we cannot reflect on it historically and

geologically at the same time, since we conflate the different scales of natural and human histories. However, whereas we are not able to build on human experience to weigh up global climate change, we still need a historical sense that enables us to plan economic, social, and political initiatives so as to redress its damaging effects. Thus, Chakrabarty points out, "in unwittingly destroying the artificial but time-honoured distinction between natural and human histories, climate scientists posit that the human being has become something much larger than the simple biological agent that he or she has always been. Humans now wield a geological force" (2009, 206). This means that we are claiming ourselves to be geological agents, but this involves reaching beyond our human time and spatial scales. In this sense, the measures of space change, since as Bruno Latour notes "it is no longer a question of landscapes, of the occupation of land, or of local impact. From now on, the comparison is made on the scale of terrestrial phenomena" (2017, 115), and we have thus moved to a different "human dimension" and reconfigured "the role of human agents" (2017, 117).[3] Therefore, the idea of the globe that the Anthropocene promotes challenges our thinking when we combine the scales through which we configure that sphere. For Latour,

> [w]hat is at stake in the Anthropocene is the order of understanding. It is not that the little human mind should be suddenly teleported into a global sphere that, in any case, would be much too vast for its small scale. It is rather that we have to slip into, envelop ourselves within, a large number of loops, so that, gradually, step by step, knowledge of the place in which we live and of the requirements of our atmospheric condition can gain greater pertinence and be experienced as urgent. (2017, 139)

Nonetheless, even conceiving the globe as a set of "contradictory and conflictual connections is not a job that can be accomplished by leaping up to a higher 'global' level to see them act like a single whole" (Latour 2017, 141). It can only at most aspire to achieve a finer sense of the paths through which to conceive globality and to expand the reach of the connections we have made thus far. This need to think simultaneously on a global, broader scale while paying attention to specific connections and issues should make sense of the problematic management of what I have called global environments, and specifically of oceans.

Oceans are central to Anthropocenic environmental and human concerns due to the rising release of methane and carbon dioxide that are absorbed by oceans – endangering marine biodiversity – and other consequences of climate

3 Even more puzzling, as Latour points out, time scales have shifted with the Anthropocene, because we are forced to think of human history from a geological time scale, but at the same time the scientific community claims that this geological change has occurred due to human intervention only in the last 200 years, with the Industrial Revolution (see Latour 2017, 117).

change such as rising seawater levels. Whereas historically ocean management has been approached from a political, economic, and social use standpoint, it is now a major ecological concern, since planetary sustainability depends on the oceans' capacity to withstand the levels of carbon (Roberts 2012). From the oceanographers' point of view in conversation with policy makers, an ecosystem approach is gaining ground as the preferred perspective for the management of global climate change. This approach does not understand "human beings and species as independent entities but as conforming an integrated and unitary system – that is a socio-ecosystem –" where "the traditional dialectic conflict 'conservation against development', which has dominated economic and political forums, has been substituted by the paradigm of 'conservation for human well-being'" (Martín-López, Gómez-Baggethun, and Montes 2009, 231–232, my translation). Adopted by the Convention of Biological Diversity as a primary framework in the mid-1990s, the ecosystem approach "has gained traction in a variety of fields and contexts, including ocean governance and fisheries management, thanks to its promise to overcome a traditionally fragmented management paradigm, and instead facilitate holistic ecosystem governance" (De Lucia 2019, 7). The current ecosystem approach seeking to achieve sustainability at a planetary level and the development of the Anthropocene discourse and awareness have powerfully reinforced the idea that oceans need to be considered a global environment, managed accordingly. If I have proposed oceans as global environments because of their combined physical and socio-cultural peculiarities, they are even more clearly so when an additional Anthropocenic, ecological perspective is the filter through which they are examined.

4 Oceans, the Anthropocene, and the Narrative Globalisation of Space: Frank Schätzing's *The Swarm*

An emerging corpus of contemporary literature is particularly interested in oceans from a global perspective: from novels dealing with overfishing as diverse as the English Ian McGuire's novel *The North Water* (2016), the Norwegian Morten Stroksen's novel *Shark Drunk: The Art of Catching a Large Shark from a Tiny Rubber Dinghy in a Big Ocean* (2017), and the Cambodian Vannak Anan Prum's graphic memoir *The Dead Eye and the Deep Blue Sea* (2018); to oil extraction at sea and its disastrous consequences in novels such as the Nigerian

Helon Habila's *Oil on Water* (2010) and the Spanish Alberto Vázquez Figueroa's *El mar en llamas* [The sea in flames] (2011).

Other global novels, which Adam Trexler (2015) usefully calls "Anthropocene fictions," assume an environmental perspective aligned with the Anthropocene and planetary environmental destruction, such as the Chilean Luis Sepúlveda's *El mundo del fin del mundo* [The world at the end of the world] (1994), the US Paulo Bacigalupi's *The Windup Girl* (2009), and the Taiwanese Ming-Yi Wu's *The Man with the Compound Eyes* (2013), which connect overfishing, the rising sea levels, and plastic waste in the oceans, respectively, with a global environmental crisis that is leaving a footprint on a planetary scale.[4] By adopting an Anthropocenic view, these novels significantly contribute to globalising the large internationally contested environments by producing what I have called global narrative environments. The case of Frank Schätzing's novel *The Swarm* illustrates how novels both narrate global space and contribute to globalising it.

Frank Schätzing's novel *The Swarm* [*Der Schwarm*] is particularly relevant to the stated arguments. Published in 2004, this German science-fiction thriller tells the story of a near future in which various activities dramatically affect sea biodiversity and change the Earth's life course. Heavily fuelled by scientific discourse, the novel deals with new technological developments in oil extraction, drilling at deeper levels in various locations, causing great releases of methane and triggering major tsunamis. This ultimately modifies molecules into a new microorganism that their discoverers call the Yrr. Simultaneously, sound pollution produced by US underwater surveillance activities affects species such as whales and orcas, which start attacking tourist boats off the West Coast of Canada. Changes in biodiversity also include the extreme proliferation of species like jellyfish. These related phenomena are progressively connected in the novel in a global catastrophe that seems to be governed by new molecules that characters speculate to have developed a consciousness that leads to the ocean's attack on and destruction of humankind, in a tribute to Stanislav Lem's novel *Solaris* (1970). Detected and fought against by a multinational US-led military and a group of scientific experts, the stories at first develop contrapuntally, but at the end converge in a human apocalypse caused by the planetary crisis.

In *The Swarm*, oceans are built as global environments. The various conflicting economic industries and activities such as fishing, drilling and tourism clash with each other at the same time, fatally threatening a sustainable future:

4 The study of oceans in literature concerned with a global view has recently grown. See for example, Mentz (2009), Blum (2010), Hofmeyr (2012), DeLoughrey (2017), Oppermann (2019), and Vidal-Pérez (2019).

> the Norwegian Ministry of Fisheries had castigated the oil industry for expelling millions of tonnes of contaminated water into the sea every day. It had lain undisturbed in subseabed petroleum reserves for millions of years but was now being pumped to the surface by the hundreds of offshore North Sea platforms that lined the Norwegian coast. The oil was separated from it by mechanical means, and the chemical-saturated water discharged back into the sea. No one had questioned the practice until, after decades the Norwegian government had asked the Institute of Marine Research to undertake a study. The findings dealt a blow to the oil industry and environmentalists alike. Substances in the water were interfering with the reproductive cycle of cod. (2006, 22)

The novel focuses on the oceanic socio-scientific concern that articulates the exploitation interest with the global environmental change this is producing. The global impact of the environmental damage produced by methane release in the experimentation with new deeper oil drilling technology in oceans is scientifically explained at length. As Andrew Milner et al. (2015) and Ursula Heise (2019) have recently proposed, science-fiction is particularly well-equipped to address the narratives of the Anthropocene, since "in so far as SF defines itself in relation to science, then it finds itself obliged to produce fictional responses to problems actually generated by contemporary scientific research" (Milner et al. 2015, 13). As with other novels such as the controversial climate-change thriller *State of Fear* (2004) by Michael Crichton, *The Swarm* heavily relies on scientific data to explain the state of the oceans. As Dürbeck notes, this is organised as dialogue between experts, between experts and ordinary people or experts and politicians or public agents (2012, 22). Thus, a scientist main character didactically explains to a friend:

> You've probably heard that the sea is full of methane . . . . Well, methane is a gas. It's stored in vast quantities beneath the ocean floor and in the continental slopes. Some of it freezes on the surface of the seabed – it combines with water to form ice. It only happens in conditions of high pressure and low temperature, so you have to go pretty deep before you find it. The ice is called methane hydrate . . . . Hordes of bacteria inhabit the oceans, and some live off methane. (Schätzing 2006, 40)

The newly discovered worms laying on the deep ocean floor in massive amounts eat the bacteria that nurtures on the methane released by aggressive oil drilling. This is part of a larger oceanic problem, since it "was merely a reflection of the true state of the seas, which were suffering the consequences of overfishing, chemical dumping, the urbanisation of coastal regions, and global warming" (Schätzing 2006, 194). Through this threaded socioeconomic and environmental perspective on a global scale, *The Swarm* approaches oceans as environments that need to be internationally managed and taken care of.

By pointing to the environmental devastation of the ocean, the novel is heavily infused with the scientific concerns that underpin the proposal of the

Anthropocene as a new geological era. As a planetary problem, these scientific findings showcase a profound environmental crisis that, as Christophe Bonneuil and Jean-Baptiste Fressoz argue, with the discovery of the Anthropocene, is no longer a crisis, but a point of no return where the damage has been forever inscribed on the soil of the Earth "with no foreseeable return to the normality of the Holocene" (2016, 21). *The Swarm*'s narrative heavily emphasises a neglected final crisis in references to Earth history in its temporal and spatial dimensions, which continuously appear in the characters' daily conversations. In the novel, exchanges between scientists account for this continuous reminder: "They are extracting ice cores from a depth of four hundred and fifty metres. Unbelievable, isn't it? Ice as old as that can tell us the history of our climate over the last seven thousand years," says one character, to which another responds: "'Most people wouldn't be impressed' . . . 'As far as they're concerned, climate history won't help eliminate world poverty or win the next world cup'" (108). Key to the Anthropocene view, the novel includes geological time and space scaling to elevate the oceanic knowledge and crisis to a planetary level. Schätzing's novel frequently associates the scale of oceans with that of the universe, addressing Chakrabarty's scaling challenge, since it conflates natural history and scientific discourse with social and individual histories. As one of the characters in *The Swarm* says, "it's on a different scale, but I'm always being told that we know less about the oceans than we do about space" (33), and later "[t]he depths beyond the shelf were an unknown universe, more mysterious to science than outer space" (46).

Finally, in the novel, the management of planetary human-driven downfall is mostly a problem of international politics where agreements are needed but actions hard to undertake collectively:

> Authority? The majority of you will be aware that three days ago Germany called for a joint European Union commission to deal with the current situation. The German minister of the interior now chairs that initiative. As a precaution, Article V of the NATO treaty has also been invoked. Norway, the UK, Belgium, the Netherlands, Denmark and the Faroes have all declared a state of emergency, in some cases regionally, in others on a national scale. (386)

The Swarm poses a new global order as a risk. As the US secret military mission warns its members: "Depending on how the international situation develops, there's every chance that the United Nations will take some kind of overall control. Throughout the world the existing order is crumbling and new jurisdictions are emerging" (386).

One of the most important challenges for contemporary narrative is its formal expression of the global. When addressing global environments in particular, the difficulty turns on what I have called "global narrative environments."

Discussions on how to narrate the global environmental crisis and the Anthropocene have revolved around the uses of genre and narrative technique. Scholars like Amitav Ghosh, Andrew Milner, Ursula Heise, Debjani Ganguly, Stewart King, and Adam Trexler have discussed these issues from the point of view of genre. Specifically, they have dealt with the difficulties of realist narrative in fitting the global scaling and the non-human perspective (Ghosh 2016), its adaptation to a catastrophic, planetary realism (Ganguly "Catastrophic" 2020), the aptitude of science fiction to include scientific data (Milner et al. 2015) and to manage the scaling difference (Heise 2019), and crime fiction's readiness to index global environmental criminality (Puxan-Oliva 2020; King 2021.). In his thorough assessment of Anthropocene fiction, Trexler points out various genre borrowings to meet the challenges of "interpretation between domestic and planetary scales," the "complex transformation of human economies, and thus human culture" due to the effects of climate change in global economy, and the shaping of narrative by "non-human things" (2015, 26).

The Swarm employs science-fiction and crime fiction narrative strategies to create the narrative tension of a scientific mystery around a catastrophe in which cause and effect expand from a long past of economic activity damaging oceans to a long future where humankind collapses. Thanks to these narrative strategies, *The Swarm* blends different scales. The novelistic plot concentrates a planetary problem affecting local contexts in particular events and characters, combined in several threaded stories, which happen simultaneously around the world in what Alexander Beecroft calls a "multi-strand plot." These include a chef's death when cooking a poisoned lobster in a French restaurant; a jellyfish invasion in Costa Rica, the Australian coast, and other locations; and a tsunami produced along the Norwegian North Sea coast. These local phenomena are narrated in a realistic manner and organised in a progressively entangled plot. The novel focuses on different populations, different environmental illegalities and abuses converging into a global oceanic rebellion against the human species that the narrative works through extrapolative science-fiction into the future (Otto 2012, 109). The discourse of the Anthropocene adds a stronger dimension to the narrative purpose, since it aids in the proposal of geological time and space scales, which appear side by side in Schätzing's novel, as we have seen.

Using a realist narrative mode, *The Swarm* also uses science-fiction unnatural narration.[5] As other novels concerned with an ecosystem approach to global

5 "Unnatural narration" is the narrative mode coined by Brian Richardson used to describe a kind of non-mimetic, non-realist narrative shown in narrative discourse and frequently used in experimental narration and in science-fiction (see Richardson 2006; Alber and Richardson 2020).

environments such as J.M. Coetzee's *Foe* (1986) or Wajdi Mouawad's *Anima* (2012), *The Swarm* adopts a posthuman materialist perspective to imagine a future where human time and space consciousness dissolve into the ocean's liquidity and its geological time and space dimensions. To adopt this Anthropocene, ecosystem perspective, the novel relies on experimental, science-fiction narrative strategies, since the realist novel form is at pains to embrace a posthuman narrative voice.[6] Interest in this formal adoption then moves the debate from thematic interest in the Anthropocene to the ways in which narrative might be able to account for the species' perspective and beyond, as the ecosystem perspective moves away from the human eye and voice. Scholars working on new materialist perspectives on global environments such as Hester Blum (2010), Philip Steinberg (2013), Serenella Iovino (2014), Elizabeth DeLoughrey (2017), and Serpil Oppermann (2019), emphasise the need to understand oceanic narration from their matter perspectives, which should enable the decentring of an anthropocentric view. In drawing on the specific narrative techniques being developed to represent the Anthropocene perspective, Erin James discusses Iovino and Oppermann's idea that matter can narrate by placing emphasis on the fact that narration involves language and is, thus, necessarily produced by humans. However, she observes that "an Anthropocene narrative theory suggests that geological strata, ice cores, and tree rings offer us a representation of a sequence of events and, as such, display a minimal amount of narrativity" (2020, 191), which makes our perception of time and space aware of other scales that involve a broader, non-human-centred scale. In this direction, at the end of *The Swarm* when the destruction of humankind is taking place, the narration evolves towards breaking mimetic language in order to produce a sense of the blending of an enigmatic, species narrative voice that feels like "a particle moving in space and time" (2006, 850) into the geological time and space parameters:

> One thousand years, little particle. More than ten generations of humans, you've circumnavigated the world.
>
> One thousand trips like that and the seabed will have renewed itself.
>
> Hundreds of new seabeds and seas will have disappeared, continents will have grown together or pulled apart, new oceans will have been created, and the face of the world will have changed.
>
> During one single second of your voyage, simple forms of life came into being and died. In nanoseconds, atoms vibrated. In a fraction of a nanosecond, chemical reactions took place.

6 See David Rodríguez (2018) for an exploration of the uses of post-human narrators in Anthropocene comics.

> And somewhere amid all this is man.
> And above all this is the yrr.
> The conscious ocean. (2006, 858)

In fact, Anthropocene fictions strain narrative technique in expressing both the scale disparity as well as a non-human-centred perspective that is, ultimately, human as well. It is this precise puzzling view that forces us to see the planet as a whole space and take an external species perspective appropriate to natural history and the sciences, while we keep our individual stories on a human scale occurring at specific times and locations. This tension lies at the heart of narratives concerned with a global perspective and, remarkably, those that directly address the Anthropocene.[7]

In *The Swarm* oceans are incontestable global environments. This space is genuinely global, since the novel cannot be told or interpreted from a national perspective, nor does it fit any national critical perspective without its concerns being severely curtailed. Therefore, oceans, along with other spaces such as outer space, air space, Antarctica and other contested vast natural spaces such as deserts, jungles, swamps, or highlands, could be seen as suitable for global perspectives like these, and thus argued as global environments, used by literature to address global concerns.

Nonetheless, powerful as the discovery of the Anthropocene might be in revealing oceans at risk, the Anthropocene is also a powerful discourse producer for global spaces. Oceans in *The Swarm* are being globalised through this Anthropocene perspective. While the Anthropocene is still controversial among scientists, Bonneuil and Fressoz are right to state that it has already had an impact as a sociocultural discourse. In their view, there is reason to suspect "that the knowledge and discourse of the Anthropocene may itself form part, perhaps unknowingly, of a hegemonic system for representing the world as a totality to be governed" (2016, 48), a narrative that "presents an abstract humanity uniformly involved – and, it implies, uniformly to blame" (2016, 66), and a discourse of awakening in which "the moderns only have to embrace the anthropocenic gospel to obtain remission of their sins and perhaps even salvation" (2016, 73). In this light, the Anthropocene

7 In her excellent chapter, dealing with space and specifically water space, James argues for an idea of "unspatialization" (2020, 195–6) or a lack of specific space that I would nuance. While there is no narration without humans, there is no territory without space, regardless of whether that is easily mappable or knowable. No geographer will affirm that the deep sea is not a space. Precisely, as this chapter argues, the problem with spaces like the sea is that they defy our ways of drawing space, especially in terms of the territorialization needed for state and corporate interests. Space in this sense, as Massey argues, is always political, regardless of how hard it might be to measure.

would be "a new teleology of ecological reflexivity and collective learning [that] replace[s] the old teleology of progress" (2016, 78). In several ways, it has not only replaced "the teleology of progress" but has heavily endorsed and worked for a capitalist, anthropocentric, Anglo-European view, as Bonneuil and Fressoz also argue, along with scholars like Jason W. Moore in his edited volume *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism* (2016), and to which others like Donna Haraway (2016), Kathryn Yusoff (2019), and Stefania Barca (2020) have responded with alternative planetary views.

As a cultural structure of feelings, to borrow Williams' words, the Anthropocene would not differ much from other totalizing global discourses. Latour includes the Anthropocene discourse among global discourses:

> Whether we are dealing with the idea of the Anthropocene, the theory of Gaia, the notion of a historical actor such as Humanity, or Nature taken as a whole, the danger is always the same: the figure of the Globe authorizes a premature leap to a higher level by confusing the figures of connection with those of totality. (2017, 130)

Discourses of the global, "notions of globe and global thinking" (Latour 2017, 138), while accounting for the needed transnational perspective when approached either from a socioeconomic or an environmental perspective, "include the immense danger of unifying too quickly what first needs to be 'composed'" (Latour 2017, 138). Narrating global environments is a way of globalising them, a way of transforming space into a "tissue of globable" (Latour 2017, 130).

In conclusion, when approaching space from a global perspective, we should consider what I have called "global environments": open spaces, legally anomalous and subject to international management, interest, and legislation, difficult to territorialize and resistant to settlement, imagined as globally shared. Global environments like oceans, deserts, highlands, Antarctica, outer space or the Earth are not suitably weighted solely through national lenses since, because they are conceived as globally shared, their management and sustainability requires a perspective that works beyond national borders. Through global narrative environments, literature helps account and discuss the global dimension of spaces like oceans, deserts, or outer space that bring with them political and socioeconomic contestation. Nonetheless, because literature participates in our need to work out a vocabulary and tools for a global critical approach, it inevitably takes part in global discourses such as those concerned, for example, with environmental sustainability or new models of economic development such as the blue growth economy. In this context, the discovery of a human footprint in the geological strata of our planet has given a final strike to the global conception of Earth and its related discourses. Central to global discourses such as the Anthropocene, global environments are also being globalised when novels purposely take them

to a planetary or worldwide scale. Indeed, the literary conceptualization of spaces like oceans as global is another element that justifies and actually produces a unitary conception and assessment of our environmental, humanitarian, economic, or political concerns from a global perspective. In this sense "global environments" in literature host the ambivalent politics of discourses on the global, which help examine current shared crises while simultaneously undertaking an effective globalising process; a double-edged resource that should not escape our consideration when assessing space from a global perspective in literature.

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