

Popular Science and Apocalyptic Narrative in Frank Schätzing's *The Swarm*

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Since the last third of the 20th century, natural and man-made disasters appear to be converging in explosive ways, blurring the boundaries between the realm of human responsibility and unaccountable destiny, between ominous hazards and manageable risks. The tsunami and nuclear disaster at Fukushima in March 2011, for example, was portrayed both as an unfortunate natural disaster and as the result of reckless collusion of greedy corporations and corrupt government agencies. The practical sense attributed to such an event always emerges in the context of broader narrative patterns. If attributing sense is already difficult for such a graphic event as an exploding and smoke-emitting nuclear reactor, creating a striking narrative around the more long-term and invisible aspects of environmental crises such as biodiversity loss, ocean acidification and climate change is undoubtedly an even more daunting task. *The Swarm*, a best-selling novel by the German author Frank Schätzing, deploys disaster narratives to condense the temporal scale of global environmental decline and eco-thriller strategies to thematize human responsibility for the ecological health of planet Earth.

Is this a way around the dilemma that environmental questions still play the “role of a ‘repressed’ power”, being “large scale and long-term” and therefore having “difficulty in being a politics of personal liberation or social mobility”, as Richard Kerridge (*Writing 2*), reflecting on Chernobyl, has pointed out? Forty years after the environmental crisis was firmly established on the global agenda,¹ the ecological state of the Earth is still in decline.² Against this background, many ecocritical studies have sought to analyse how literary texts represent the environmental crisis and what responses they feature (Garrard 4). They pay particular attention to ethical and aesthetic issues (Clark 2011) and assume that literature “continues to play a role in the ongoing process of construction and modification of public attitudes” (Goodbody, *Nature, Technology* 277). This critical interest is epitomized in Hubert Zapf’s statement that literature as a cognitive and creative power draws a threefold dynamic in its relationship to the larger cultural system – as a cultural-critical metadiscourse, an imaginative counterdiscourse, and a reintegrative interdiscourse (Zapf, “Ecocriticism” 138). Particularly, the “function of a cultural-critical metadiscourse [...] serving as [...] a medium for taking stock symbolically of undesirable cultural developments, symptoms

¹ With the landmark event of the UN Stockholm Conference 1972 and the publication of the Report to the *Club of Rome* in 1973.

² See, for example, the *Millenium Ecosystem Assessment* (2007) or the reports from the *Intergovernmental Panel on Climate Change* (IPCC 2007).

of cultural paralysis and cultural pathologies" (Zapf, "Kulturökologie" 33)³ and the concept of literature as "a medium of constant cultural self-renewal" (Zapf, "Ecocriticism") open up an analytical perspective focusing on the capacity of literary texts to reflect and criticize oppressive structures in the cultural system and to articulate alternative discourses, thereby condensing and transforming the public discourse.

In literary texts, natural and anthropogenic disasters are often depicted by using the dramatizing rhetoric of the apocalypse, which Lawrence Buell has identified as a master narrative of contemporary environmental literature (Buell 285; see also Garrard 95-107). Apocalyptic narratives are often combined with ideas of "punishment" by a divine entity or, more secularly, of punishment "by nature for human transgression" (Goodbody, "Nature's Revenge" 1). But whereas the original meaning of the revelation was the epiphany of a new perfect world after the destruction of the current one, the cathartic dimension has been truncated after the great catastrophes of the 20th century (Vondung 134). Simultaneously, the aesthetic functions of apocalyptic visions oscillate between deriving pleasure from and warning against the destruction of nature and the world (Kerridge, "Ecothrillers" 245f.).

Schätzing's *The Swarm* is one of the last decade's most prominent examples of fiction that depicts environmental disasters using the rhetoric of the apocalypse. Adopting a science-in-fiction style, the novel describes a cascade of natural catastrophes which start as local incidents but increasingly threaten the whole of humankind. The global-scale disaster is caused by a mysterious intelligence in the ocean consisting of a swarm of individual monocellular beings which takes revenge on the humans for their ongoing pollution of the sea.

Reviews of Schätzing's *The Swarm* fall into two camps. One holds that the eco-thriller astutely popularises ecological knowledge and illuminates complex scientific phenomena in an action-packed narrative, and warns the public about environmental destruction.⁴ The other camp denies the book any enlightening function, noting critically that the insinuated 'hope of salvation' at the end of the book incapacitates the reader (Wanning 357) and its "hymnic new eco-pantheism" (Detje 16) betrays irrational tendencies.

From an ecocritical point of view, this essay analyses the functions of the rhetoric of apocalypse by asking how popular science and the entertaining and narrative conventions of the eco-thriller genre (e.g., catastrophic escalation, mythical powers) support or constrain a possible critical message of *The Swarm*. First, I analyse the strategies of popularising knowledge; then I show that the central conflict in the story presents conflicting concepts of nature; finally, I discuss how the form and apocalyptical patterns shape the novel's message.

³ „[...] Eine kritische Funktion der Literatur als kulturkritischer Metadiskurs. In dieser Hinsicht fungiert Literatur als Sensorium und symbolische Bilanzierungsinstanz für kulturelle Fehlentwicklungen, Erstarrungssymptome und Pathologien" (Zapf 33). All translations from German sources (Detje, Horn, Kretschmann, Lehnert, Niederhauser, Schätzing, Vondung, Wanning, Zapf) by the author.

⁴ See, for example: <http://www.planeterde.de/aktuelles/geo-szene/Schwarm/>, this website is supported by the UNESCO and the German Federal Ministry of Education and Research (BMBF); http://www.g-o.de/geounion-aws_koepfe-7418.html.

1. Popularising scientific knowledge

The Swarm draws on contemporary scientific knowledge from various fields such as deep sea research, environmental science, microbiology, genetics, network theories, and behaviour research. Additionally, it also incorporates knowledge about nature from indigenous peoples like the Inuit and Native North Americans. This knowledge is carefully presented by an omniscient narrator in passages in which a range of popularising strategies and techniques are employed: summing up recent debates, reducing the extent and complexity of factual information, presenting arguments comprehensibly and clarifying them through illustration, providing only a short appendix with further information, and last but not least, personalising the scientific issues and relating them to the audience's everyday experience (Daum 243-257; Niederhauser 169-179).⁵ By their very nature, eco-thrillers aim to have a high impact on large audiences by following the principle that escalation sells. The novel includes numerous references to popular disaster and action movies such as *War of the Planets*, *The Abyss*, *Armageddon*, *Deep Impact*, and *Independence Day*, reaching out to the receptive experience of a broader audience; in its composition, it follows an almost cinematic logic and seems to be written for film adaptation.

In *The Swarm*, each of the above-mentioned scientific fields is more or less represented by a particular character. Detailed knowledge, for example on chemical isotopes or the immense effect of methane which "boosts the greenhouse effect 30 times more than carbon dioxide" (Schätzing 135), is inserted into common non-academic situations such as a conversation in a coffee shop, in a restaurant or during a taxi ride (Schätzing 54f., 125). It is significant that knowledge is mainly presented in dialogues, or scientists' short speeches, or by the narrator. An example of this is a passage about the Storegga Slide, an underwater landslide on Norway's continental shelf which caused a large tsunami, which might have been triggered by leaking gas (Schätzing 395f.). Three forms of knowledge transfer can be further distinguished: i) dialogues between experts from different scientific fields, ii) hierarchical transfer when an expert explains scientific issues to ordinary people, and iii) processes of mutual influence between experts and politicians or secret service agents. In all three modes, the knowledge is transformed and constituted in new, more approachable ways, rather than merely being simplified (Kretschmann 16). The author uses these three modes and there are not presented in a dry manner.

i) Although scientific terms are generally used scarcely in popularising texts, in *The Swarm* they are often inserted into dialogues between experts, where they are explained at the same time. They are contextualized in a colloquial, often non-academic, even cheeky diction. The lax language subverts any nimbus of the described science and helps to bridge the gap between experts and lay knowledge.

⁵ According to the high amount of popularised knowledge, Hahnemann has interpreted the novel as a mixture of fiction and non-fiction.

ii) As in many other popularisations of science, *The Swarm* often conveys a hierarchy between experts and laypersons through the use of typical pedagogic and mediating situations, and this is not always done in an ironic way. For example, standing in front of a deep sea simulator, the semi-fictional professor Gerhard Bohrmann from the GEOMAR Research Center for Marine Geosciences explains to a school class how the degradation of methane hydrate works (Schätzing 126-131); or an expert explains the role of isotopes for the generation of methane to a layperson step by step using a question and answer scheme (Schätzing 98). References to real, existing individuals and institutions which are listed in the appendix of the novel underscore the scientific credibility of the depicted theories and facts.

Furthermore, science is presented not as neutral but as tied to purposes and interests. For example, the possible use of methane hydrate for energy extraction is pointed out (Schätzing 141). Schätzing critically describes how various international energy companies are involved in researching the possibilities of enhanced methane recovery by drilling into the continental shelf. In contrast to such very practically oriented applied science, one scientist pleads for technically advanced basic research into the worms which are destabilizing the continental shelf before allowing the exploitation of the methane hydrate as a new energy source to start (Schätzing 256). As a result, the novel supports the conception of 'cultural-critical metadiscourse', not only by engaging in the critique of real existing developments, e.g. short-sighted energy exploitation; but also more fundamentally, by depicting the swarm's aggression as a response to humanity's ruthless and unceasing pollution and exploitation of the ocean throughout the entire novel.

iii) Knowledge about the mysterious swarm intelligence, the *novum* in the science fiction part of the novel (Suvin),⁶ is created through mutual communication between many characters who represent a variety of institutions such as whale watching and environmental organisations, academic bodies, transnational oil and energy companies as well as the press, politicians, and secret agents, the latter only from the United States. As the story unfolds and a task force is established to address the swarm's attacks, two competing camps emerge: one group aims to extinguish the alien superorganism in the deep sea (likened to extraterrestrial intelligence by the figure Samantha Crowe, an astrophysicist) by developing a secret weapon; the other group aspires to integrate the alien organism into the human world and propagates a holistic world view. The inclusion of contrasting concepts of nature moves the novel beyond most traditional popularisations of science, as we will see in the next section.

2. Anthropocentrism vs. biocentrism

Reflection on concepts of nature has been a long-standing subject in environmental literature. In *The Swarm*, two contrasting approaches towards nature are juxtaposed: anthropocentrism and eco-systems thinking. The critique of

⁶ Swarm behaviour and attacks are part of Michael Crichton's *Prey* (2002) but ascribed to terrestrial nanotechnology and not to a maritime setting or originating in nature.

anthropocentrism has always been a characteristic feature of eco-literature (Clark 3; Heise, "Ecocriticism" 128). Anthropocentrism conceives nature "primarily as a resource for human beings" (Clark 2) who have acquired dominion over the Earth. This Promethean concept is rooted in the Christian-Occidental tradition and has formed the ideals of the Early Modern sciences (Sutton 24). In contrast, eco-systemic thinking assumes that humans are not the 'crown of creation' but a part of it; nature should therefore be "treated with reverence and respect" (Sutton 13). In *The Swarm*, when the characters search for connections between globally dispersed catastrophic anomalies, concepts of communication and interconnectedness, system and network are woven into the story. This holistic explanation conceives humans as part of complex interconnected ecological systems. In contrast, US-American protagonists with modernist, linear thinking are able to neither understand nor stop the maritime attacks. Eco-systemic thinking is portrayed in four variations, three of them premodern and the fourth a recent one.

i) The prologue introduces the topic of environmental crises by presenting two different relationships with nature. The first, an instrumental one, which encourages irreversible industrial over-exploitation of fishing grounds and the destruction of traditional fishing societies, is contrasted with the second, a traditional relationship based on nature religion: for example, the weather phenomenon El Niño is interpreted as a "punishment by heaven" (Schätzing 13). ii) One of the key elements in understanding the activity of the aggressive superorganism is the knowledge of the Inuits, who consider nature "part of the ensouled world" (Schätzing 627) in which humans are integrated. One of the characters, the Canadian aboriginal environmentalist Greywolf, interprets the aggression of the whales as "nature's revenge" (Schätzing 154) and asserts that nature acts in its own way and ascribes a mythical potency to it. iii) The motto at the beginning of the novel "Hishuk ish ts'awalk", i.e. "all is one" (Schätzing 7, 309), which originates from the Canadian Nuu-chaa-nulth First Nations people, articulates a premodern image of nature. In the novel, such images of unity and wholeness form the key to understanding the alien 'entity' in the ocean. Natural religious ideas are amalgamated with recent network theories. Taken together, these variants of ecosystemic thinking constitute a 'soft' pantheism, one cushioned by exotic flavouring.

In the conception of the swarm, Frank Schätzing has adopted not only earlier ideas of biological self-organisation (Horn, "Das Leben" 121) but also global network theories (Horn, *Der geheime Krieg* 492). Most importantly, the description of the swarm resembles William Morton Wheeler's concept of a 'superorganism' with a collective intelligence (published in 1928) which could consist of an entire ant colony or colonies of other social insects such as bees, wasps or termites. It also assimilates more recent ideas from microbiology, biophysics, cybernetics and computer science. In the novel, the scientists wonder whether "a higher entity has emerged from a conglomerate of cells" (Schätzing 711). The swarm is depicted as a form of organisation which permanently changes its shape, merges with various other organisms, divides itself and reunites again, whereby each single cell is active through pheromone communication.

Scientific swarm theory has also been adopted in organisation and management studies where complex organisational patterns are explained as emerging from the interaction of decentralized agents; complex organisational behaviour “can arise from very simple rules” (Bonabeau and Meyer 111). Swarm intelligence is hailed for three characteristics: flexibility, robustness and self-organisation (Schätzing 108). These capacities can also be identified in the maritime superorganism in Schätzing’s novel, where the swarm appears as a robust gelatinous mass that constantly changes and merges with a variety of species in distant places across the globe. The swarm is even ascribed the capacity to learn by gathering information through merging with other organisms and in the process developing a “race memory” (Schätzing 860) which gives it an evolutionary advantage over human beings and makes it superior to them through seniority.

In the fifth and final part of the novel, the science journalist Karen Weaver meets the ‘queen’ of the superorganism at the bottom of the Greenland Basin and finds herself overwhelmed by the “fantastic, alien spectacle” (Schätzing 970) of the permanently changing shape of the superorganism and the phenomenon of bioluminescence. She interprets the self-organisation of the zillions of cells into one organism as “proof of the existence of a distinct, definitive non-human intelligence” (Schätzing). Earlier in the story, knowledge about superorganisms leads to a “changed perspective” among some of the researchers: “We cannot and do not need to understand the Yrr. But we have to admit space to that which we cannot understand” (Schätzing 775). There is resonance with the biocentric perspective of deep ecology (see Garrard 90f.) or even the gaia-hypothesis (Lovelock), where the whole biosphere is regarded as a superorganism and provides an ‘allegory of a global connectedness’ (Heise, *Sense of Place* 19 and 22-26).

Weaver’s spiritual and aesthetic enchantment with the queen of the swarm and her experience of unity, however, remain questionable. Although this kind of “nature spirituality” (Horn, “Das Leben” 120) is connotated quite positively because it seems to induce the end of the attacks, Weaver’s experience also resembles subjection to an overpowering authority. Such subjection to a non-human superorganism hardly constitutes a viable and acceptable response to the environmental crisis in a pluralistic society (Dürbeck and Feindt 226f.). At the same time, from the perspective of ecology as a “cultural project” (Böhme et al. 123), the aesthetic enchantment depicted can also be seen as a contribution to literary attempts at the “reconciliation of humankind with nature” (Goodbody, *Nature, Technology* 270f.).⁷ The apocalyptic narrative would employ a kind of “pastoral countermodel to the toxic world” where ecological systems are conceived as “harmonious and balanced networks” (Heise, *Sense of place* 140). In the final part of *The Swarm*, however, such a reconciliatory outlook remains highly ambivalent for at least two reasons: First, by simultaneously conveying terror and fascination, the fictitious deep-sea intelligence displays the ambivalence of objects of religious veneration, rather than systemic enquiry. Secondly, the fictitious science journalist replaces her initial attitude of holistic analysis with one of mythical reunion.

⁷ The Romantic idea that humankind can live in harmony with nature can also be revealed as anthropocentric, as Bergthaller (2010) has demonstrated (see also Brake and Corporaal).

This episode undermines the novel's ecological-reflexive message and shifts the discourse from critical rationalism to the realm of pseudo-religion and pantheism.

3. Tragic and comical apocalypse

One of the most striking features of *The Swarm* is how it combines popularising diction and the rhetoric of apocalypse. The first part of the novel is preceded by a motto taken from the Book of Revelations 16:3: "The second angel poured out his bowl on the sea, and it turned into blood like that of a dead man, and every living thing in the sea died [...]" (Schätzing 25). The chapter "Anomalies" (Schätzing) describes how a number of curious catastrophes – e.g., whales attacking boats, poisonous lobsters in a French gourmet restaurant cracking open and contaminating the ground-water, mysterious worms destabilising the stratum of oceanic methane hydrate – culminate in a horrendous disaster as the continental shelf off the Norwegian coast collapses and triggers a tsunami killing "hundreds of thousands" of Northern Europeans (Schätzing 435). The catastrophe evokes comparisons with an "enraged God" (ibid. 397) and a "maelstrom" (ibid. 398). At the same time, there is little concrete description of the consequences of the disaster for people and society. Instead, the narrator explicitly concludes: "It was the Apocalypse." (Schätzing 425) Indeed, the escalation in the novel displays several parallels with catastrophes in the Book of Revelation such as hailstorms, fire, rolling thunder, darkness, bitter water and shipwrecks. However, at first sight, there appears to be no equivalent to the Last Judgement and the redemption it affords in *The Swarm*. In lieu of a catharsis, the catastrophic escalation serves as a "source of pleasure" for the reader, following the genre conventions of thrillers (Kerridge, "Ecothrillers" 246; see also Vondung 134) and science fiction (Lehnert 304). The same escalation found in apocalyptic scenes is discernible at the end of the fourth part of *The Swarm*, where the aircraft carrier USS Independence is destroyed in a dramatic showdown during which all of the 'bad' characters are annihilated.

However, with its interplay of narrative elements which are rooted in different and often contradictory discourses, *The Swarm* eludes simple interpretation. Although the motif of the apocalypse is not explicitly resumed in the later part of the book, the destruction of the 'bad' characters and the transformation of the 'good' characters that survive resemble the narrative pattern of apocalyptic redemption, which, however, is postponed. To better understand how the apocalyptic motif is preserved in the novel's closure, it is helpful to recall Stephen O'Leary's distinction between a tragic and a comic frame of the apocalypse, a concept that Greg Garrard (87) has adopted for ecocritical discourse:

Tragedy conceives of evil in terms of guilt; its mechanism of redemption is victimage, its plot moves inexorably toward sacrifice and the 'cult of the kill'. Comedy conceives of evil not as a guilt, but as error; its mechanism of redemption is recognition rather than victimage, and its plot moves not toward sacrifice but to exposure of fallibility. (O'Leary 68)

Tragic guilt and sacrifice contrast with error and failure, where the latter are redeemable through recognition. While tragedy ultimately ends in a catastrophic conclusion, in comedy, time is “open-ended and episodic” (Garrard 87). Applying these concepts to Schätzing’s novel, the destruction of the USS Independence can be seen as a ‘tragic apocalypse’: guilt arising from exploiting nature, the hybrid optimism of progress, and linear modernist thinking lead to disaster and destruction. On the other hand, the epilogue, in which scientist Samantha Crowe reflects on a year in which there had been no further attacks from the ocean, resembles a ‘comic apocalypse’. She explicitly addresses humans’ ability to learn and change their attitude towards nature: “The Yrr have not changed the world. They have shown us the world as it is. Nothing remains as it was before.” (Schätzing 987) From this perspective, what appeared to be “nature’s revenge” (Schätzing 154) was rather a harsh warning that functioned as a learning process, allowing the human race to gain insight into their mistakes and to transform their attitudes. This is underscored by quite a bold message in the same epilogue: “there are the first signs of rethinking the role we play on the planet” (Schätzing 986). In this context, all the classical ecological issues – atmospheric pollution, biodiversity loss, over-fishing etc. (Schätzing 987) – are enumerated as humanity’s responsibility. Although the discontinuation of the attacks appeals to human agency, Crowe remains doubtful about humans’ willingness to abandon their claim to superiority over other species (Schätzing 984f.). The critical allusion to Christian belief in a human mission to exert dominion over creation makes it clear that not only is instrumental reason put on trial but also Promethean interpretations of the Bible. The trope of the fallible creator – “God’s creation of men has failed to deliver a masterpiece” (Schätzing 984) – expresses a fundamental pessimism; but it also conveys a welcome excuse for failing to be a good steward of nature and the environment. Here, the novel follows a narrative pattern typical of science fiction, which portrays history as “a sequence of always the same failures leading to apocalypse” (Lehnert 300). With these ambivalent reflections of a positively connotated figure, the epilogue provides at least two different outlooks at the very end of the novel: a pessimistic one which assumes that humans will never learn from their failings because they are imperfect and sinful and expect no immediate advantage from changing their attitudes; and an optimistic one which appeals to a voluntary transformability of human attitudes towards nature. These two outlooks stand side by side, contributing to the novel’s ambivalence.

In sum, *The Swarm* exposes three contrasting constellations of human beings and nature: i) Promethean dominion over the planet, leading to over-exploitation and environmental disaster; ii) subjection of mankind to an eco-systemic nature which appears as intelligent and efficient, a vision with romantic, pseudo-religious and utopian overtones that in the context of the apocalyptic rhetoric fulfils a cathartic function; and iii) a network of responsible individuals whose relation to nature is based on insight into ecological limits, who practice dialogue, communication and creativity, and are prepared to recognise the connectedness of social and ecological systems. While Promethean instrumentalism decreases and deep ecology provides only temporary relief, ecologically reflective practical reason seems to have the last word when the epilogue

comments on the disasters which have been overcome from a detached standpoint. In this sense, the novel may provide an explicit eco-critical message. Since the epilogue's message, however, is neither embedded in the main diegesis nor contextualized in concrete social stories and political circumstances, the insight into human fallibility and the suggested rethinking of anthropocentric exploitation remain a rather abstract postulate. The book is a warning, but it also supports the view that, even if we have a narrow escape, the crisis may not be as bad as environmentalists claim. In this respect, the novel's support for environmental concerns is limited. On the other hand, Schätzing does not merely exploit fears of deadly ecological threats for marketing purposes. There is no denying his novel makes a serious effort to popularise eco-system thinking – in particular compared to works like Michael Crichton's *State of Fear* (2004), which downplays anthropogenic causes of the environmental crisis and depicts ecological science as a conspiracy.⁸

The problem with *The Swarm* is that the fantastic and mythical tendencies tend to overwhelm the more enlightened and critical elements, even if the contemplative epilogue appeals to the human ability to rethink attitudes towards nature. As a vehicle for eco-critical thinking, eco-thrillers may suffer from an intrinsic dilemma: either to provide sufficient suspense in line with readers' expectations or to convey plausible explanations for the causes of the ecological crisis and more sustainable practices.

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⁸ See the critical comment on Crichton's *State of Fear* as "State of Confusion": <http://www.realclimate.org/index.php/archives/2004/12/michael-crichtons-state-of-confusion>, 3 July 2011.

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