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# The Future: Missing Children, Time Travel, and Post-Nuclear Apocalypse in the *Dark* Series (Netflix)

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**Abstract:** The concept of the post-apocalypse, a cultural imagination of nuclear energy, the temporality of trauma, and time travel are linked herein in order to arrive at a political reading of the *Dark* series. This show is a commentary on the phasing out of nuclear power in Germany in response to the nuclear disaster in Fukushima. Two readings of this series are proposed: a meditation on the possible futures of the world (the possibility of reparative action and the post-apocalypse) and a traumatic narrative (the concepts of trauma and loss are crucial to understanding the plot, while both the visuals and the plot borrow from posttraumatic cinema). Nevertheless, the series plays by the rules of popular trauma culture, rules whereby a tragedy suffered by others serves the economic interests of the media.

**Keywords:** trauma; time travel; nuclear power; energy humanities; *Dark* (Netflix series); the future

> Jonas: I want this to finally end. All of it!
>
> Adam: Don't worry it will end. That is inevitable.
>
> Your end. My end. Upon closer examination, everyone's end.
>
> *Dark* (Odar and Friese 2017–2020)
>
> If catastrophe seems to loom in the future, do you anticipate
>
> and act quickly to prevent it, or do you start to mourn your
>
> loss in the present as if the future had already come to pass?
>
> (Cunningham 2014, p. 462)

## 1. Introduction

In the music video for "Human" (Annisokay 2023), German post-hardcore band Annisokay imagines the downfall of humanity being caused by a nuclear blast. A host of characters—Adam and Eve, a Napoleonic-era cavalry soldier, a businesswoman, and others—are caught in the shockwave, having only been given a brief warning about their impending doom. Seconds before they are engulfed in a whirlwind of dust[1], they cover their eyes to protect them from the blinding light of the nuclear explosion. The video reflects the lyrics in condemning what, in academic discourse, is called the Capitalocene (Moore 2016), i.e., the destructive global spread of capitalism. However, this choice of catastrophic ending is by no means self-explanatory. One might wonder why a dressed-to-the-nines businessman would annihilate the world in a single blow, instead of continuing to exploit it for his own benefit until the non-event of climate catastrophe wreaked its own havoc? A penchant for spectacular destruction informs cinematic imagination, frequently at the cost of ignoring slower catastrophes until they take on apocalyptic proportions. Nuclear weapons and nuclear energy are a case in point, as popular representations of mushroom clouds greatly outnumber images of nuclear waste or the effects of radiation.

In what follows, I link the post-apocalypse, a cultural imagination of nuclear energy, the temporality of trauma, and—last but not least—time travel in order to arrive at a

political reading of a recent meditation on the phasing out of nuclear power in Germany that was, itself, a response to the nuclear disaster in Fukushima. In doing so, I combine insights from trauma theory, literary and cultural history, and energy humanities. Given the nuclear explosion depicted in *Dark*, a German series produced for the streaming service Netflix (Odar and Friese 2017–2020), it seems fitting to read the series as an expression of apocalyptic sensibility as well as a commentary on recent political decisions in Germany. The series' international success on the streaming platform is proof that its creators delivered content that spoke to Western audiences by tackling socially important topics. The series merges previously separate concepts—trauma, energy, and time—by ingeniously weaving narrative and visual conventions of trauma into its plot and visual language. In my opinion, the interests of its creators align with the concerns expressed by academics who are studying cultural responses to the climate catastrophe and arguing that modern energy regimes can no longer be ignored in the study of culture. I propose the following two readings of this series: a meditation on the possible futures of the world (the possibility of reparative action and the post-apocalypse) and a traumatic narrative (the concepts of trauma and loss are crucial to understanding the plot, while both the visuals and the plot borrow from posttraumatic cinema).

## 2. Post-Apocalyptic Meditations on Time Travel

*Dark* develops a convoluted plot with doppelganger characters at different points on a complicated timeline interspersed with patricidal, matricidal, filicidal, fratricidal, and suicidal violence. In the German town of Winden, several children have gone missing, scarring the community. However, this run-of-the-mill detective fiction, employing common-sensical explanations, soon morphs into an unbridled exploration of the paradoxes of time travel, bizarre plot twists, parallel universes, and a series of botched attempts to save the world from a pending apocalypse. The story develops over three seasons (twenty-six episodes) with each new season adding a new level of complexity to the represented world(s). In fact, the audience is mostly incapable of reconstructing the story on their own and has to rely on a set of paratexts: "fan blogs, official companion websites, and YouTube recuts" to make sense of what is going on (Holt 2022, p. 284). Furthermore, these diegetic complications stem from the distribution model on the streaming platform and simultaneously offer a commentary on the alleged perils of non-linear television (Holt 2022, pp. 280–81). However, the creators do not leave the audience without clues, as episodes end with a music-video-like coda summing up the major temporal shifts and highlighting the relationships between characters at a given historical moment. The complete timeline of the show covers a period stretching between 1888 and 2053, with characters jumping around in time in thirty-three-year intervals. In this way, Mikkel—a boy who went missing in 2019—finds himself trapped in 1986 and is forced to grow up with his parents' peers.[2] This clever narrative device allows the series' creators to skip a direct representation of the Third Reich as there is a fortuitous gap between 1920 and 1953. Therefore, unsuccessful Nazi experiments in producing an atomic bomb are absent from the plot, which jumps forward to the postwar energy regime of nuclear power. And yet, an emphasis on missing children serves as a displaced reference to Nazi medical experiments, symbolized by the menacing character of Noah—an evil priest bent on torturing children (Batori 2021, p. 115).[3] Xan Holt praises *Dark* for its clever incorporation of missing children, a popular narrative device in Germaphone and other European television productions (Holt 2022, pp. 272–73). The series hints at yet another totalitarian regime as 1986 is the year the Chernobyl disaster happened in the Soviet Union. In fact, *Dark* orchestrates a fictional accident at the Winden plant a few months after the Chernobyl meltdown, with a time traveler triggering the malfunction. Nuclear waste produced in the process stores energy that will destroy the world in 2020.

In *Dark*, an impulse to create a time machine comes from the intense suffering caused by losing relatives. Some time machines merely allow characters to travel through time in thirty-three-year intervals, while another produces an alternate reality, erasing a traumatic event which upended the life of its designer: H.G. Tannhaus. In a tragic car accident, he lost

his son, daughter-in-law, and granddaughter. Splitting the world into two alternative realities, he refuses to deal with his loss but sets the world on a catastrophic path. In this sense, the series ties individual loss with societal and environmental trauma. Adam—an old version of teenager Jonas Kahnwald who discovers the secret of time travel and reveals it to the series' audience—comes up with the ultimate time machine, which can transport the traveler to any year, without the thirty-three-year limitation. Juliana Blank believes that the application of generic conventions of science fiction—in its time-travel guise—is an exploration of failure, pain, and trauma extending over several generations (Blank 2022, p. 18). The series provides ample material to inspire discussion about the temporality of trauma, seemingly endless loops of suffering, and the potential to undo damage in the past and in the future. The fate of characters is part and parcel of the fate of the universe, while reversing the course of events may be read as a commentary on the Anthropocene (Sideris 2020).

The construction of a nuclear power plant in Winden in 1953 is made possible due to a devilish plot involving time travelers who require its energy to set the alternative world in motion and simultaneously to prevent the apocalypse from happening. In 2020, the plant is to be decommissioned as it is no longer safe to use and, in addition to that, it is a site storing hazardous nuclear waste. Maren Lickhardt is puzzled by the choice of nuclear power as a topic for the series as, in her view, the danger associated with this form of energy is over (Lickhardt 2021, p. 120). Such a narrow understanding of the temporality of nuclear energy will be criticized herein. On a different note, *Dark* debunks the technological optimism of Germany in the 1950s (Lickhardt 2021, p. 120). A focus on the hopes and fears associated with the nuclear power plant endows time travel with a dose of ecological responsibility (Blank 2022, p. 31). The cinematic defamiliarization of time has become a staple in popular cinema in recent decades, employed predominantly as a plot device with "unmarked flashbacks, flashforwards, and narrative structures of varied complexity" (Quinn 2022, p. 88). Seen through the lens of trauma theory, these formal devices stem from posttraumatic cinema with its ambition to mimic a temporal disruption of a traumatized subject and to convey their disorientation to the audience (Hirsch 2004). Another critic argues that complicated plotlines are a defining feature of prestige television, engaging viewers in the process of co-production (Batori 2021, p. 114). What is more, the scarcely explained multitude of temporal perspectives "requires a great analytical potential from the viewer to remember the characters from 1953, 1986 and 2019, while understanding and recalling the circular sense of the storytelling form" (Batori 2021, p. 119). Despite its postmodern narrative devices, *Dark* creatively refigures German history as an endless cycle of violence, in which even redemptive decisions (phasing out nuclear power) cannot prevent the onset of a catastrophe (Batori 2021, p. 120).

One needs to contextualize the story told in *Dark* by linking it to a renewed interest in the Chernobyl nuclear disaster and, even more importantly, to a political decision in Germany to shut down its seventeen nuclear power plants in response to the meltdown in Fukushima (Cho 2022, p. 33). Upon learning of the accident in Japan on 11 March 2011, it took Chancellor Angela Merkel just three days to announce the complete shutdown of Germany's nuclear power plants. The shutdown of a fictional power plant in Winden triggers the apocalypse, an event that the characters either try to prevent from happening in 2020 or endeavor to make sure does happen to end a vicious circle of pointless time travel. In fact, the final three plants were recently shut down in Germany on 15 April 2023, a decision postponed due to the outbreak of Russia's full-scale invasion of Ukraine in February 2022. For Jean-Luc Nancy, nuclear catastrophe is potentially irreversible, stretched over generations and geological deposits and observed in living organisms and energy regimes (Nancy 2015, p. 3). In literary criticism, the dropping of the atomic bomb on Hiroshima created an effect of "futurelessness", by virtue of which nuclearism and postmodernism became (problematically) entwined (Pedretti 2013). In assessing the role of nuclear power, two attitudes toward it clash: its perception as a form of green energy, ignoring the problem of the radioactive waste (Cho 2022, p. 35), and its threat to the future of humankind if things go south. In Germany, there is a tradition of antinuclear protests, claiming environmentalism as its rationale (Cho 2022, pp. 39–41). Thus, the political

reaction to Fukushima tapped into an already well-publicized skepticism toward nuclear power (Cho 2022, p. 42). Recently, an HBO-produced series *Chernobyl* (Renck 2019) reanimated a cultural memory of this nuclear accident while simultaneously heightening interest in other burning issues, such as climate change (Gambarato et al. 2022, p. 279). Furthermore, it provided arguments for environmentally conscious politicians and activists, deriding the nuclear pipe dreams of right-wing politicians as a nostalgic throwback to the technological optimism of the 1960s (Gambarato et al. 2022, p. 280). The mini-series was also highly successful in visualizing the invisible threat of radiation as a "spectral toxicity"—affectively causing fear and anxiety (Skiveren 2020, p. 77). *Chernobyl* thus shows human experience at its limits and undermines our anthropocentric hubris (Skiveren 2020, p. 81).

Claudette Lauzon and John O'Brian argue that an understanding of late-modern pathologies, ranging from "weapons proliferation and aerial surveillance to toxic waste disposal and climate change," hinges on treating them as "atomic by-products" (Lauzon and O'Brien 2020, p. 3). And yet, there has been a strange amnesia following the end of the Cold War by virtue of which societies have forgotten the atomic fears of that era (Lauzon and O'Brien 2020, p. 5). In cultural practice, the atomic era goes through a cycle of anniversaries in which pivotal events in its history resurface, frequently causing public alarm (Villette 2021, p. 233). Such anniversaries are inscribed onto "the structures of nuclear ontological time. That of the deep time of transuranic isotopes, of the slow violence deployed at vast temporal scales, of nonlinear fold of time, of illnesses and psychological effects that operate at multiple and unexpected durations" (Villette 2021, p. 233). When analyzed from the perspective of material cultures, nuclear industries continue to search for new materials and technologies in which to bury radioactive materials (Villette 2021, p. 243). For this reason alone, nuclear power is a future-oriented endeavor, constantly in search of safeguards against its potential detrimental side effects. Therefore, the closing of the nuclear power plant in Winden does not erase its impact on characters in *Dark*, nor on the environment, as the radioactive waste is still a source of the apocalypse.

Nicholas Mirzoeff's description of our current era, "the Anthropocene is a human-created machine that is now unconsciously bent on its own destruction" (Mirzoeff 2014, p. 213), reads as an apt review of *Dark*. In its temporal dimension, the Anthropocene negates the pastness of the industrial era as its effects are always contemporary. The same goes for its spatial dimensions, as it leaves no location outside its reach (Mirzoeff 2014, p. 215). Inasmuch as the series sets time in motion, it traps characters in the limited space of a small German town. Stressing individual responsibility begs the question of how to scale the local, especially when the series' notion of the interconnectedness of everything is translated from its temporal dimension to a spatial one. By this token, *Dark* posits a question about the planetary dimensions of human action.

Discussing the divergent temporalities of climate change and the Anthropocene, Julia Nordblad claims that the former allows for imagining different futures, which opens up the stage for political action. The Anthropocene, on the other hand, excludes such interventions as it proposes to look at our era from the vantage point of geological deep time (Nordblad 2021, pp. 330–32). From this perspective, our day and age will leave geological deposits, and ubiquitous consumerism is a moral perversion (Nordblad 2021, p. 332). Unfortunately, the temporal determinism of the Anthropocene, which treats the future as the past, closes off the avenue to political change. Climate change is conceptualized as a set of future scenarios dependent on actions undertaken now, making the concept politically productive (Nordblad 2021, pp. 336–37). To retain political usefulness, climate change needs to protect the open future, without the catastrophic determinism of unchecked carbon emissions (Nordblad 2021, pp. 341–46). Speaking of time in the Anthropocene, Matthias Fritsch notes that, at present, our temporal horizon stretches far into the past and the future, by accessing geological data and climate modeling, respectively. This situation places the burden of long-term intergenerational responsibility upon our shoulders, requiring a re-assessment of our everyday practices in the light of their future impact (Fritsch 2018, pp. 157–58). The future alternates between an irreversible determinism (a fate carved

in stone) and a call for preventative action, inspiring "rushing, prediction, anticipation, breathlessness" (Cunningham 2014, p. 460). The paradox of the future as simultaneously known and unknown, preventable and unavoidable, hinges on "the time of prognosis" which disrupts mourning and undermines "effective anticipation", attenuating "human control" (Cunningham 2014, p. 463). In temporal terms, it is nigh on impossible to disentangle the future projection of trauma and its unacknowledged past (Cunningham 2014, p. 465). The reliance on prognosis entails disrupting timelines and "living in nonlinear time" (Cunningham 2014, p. 468). As a result, the aporetic nature of the future erodes the value of human experience, as it is simultaneously rendered both useless and of critical importance.

Zooming in on energy, especially on oil, has become a new frontier in trauma studies and has ushered in a new discipline, namely energy humanities. As Stephanie LeMenager makes clear, petroculture engenders melancholia in relation to an energy regime tied to fossil fuels at a time when its unsustainability can no longer be hidden. This new melancholia regarding the passing of modernity is entangled with an earlier environmentalist melancholia concerning the loss of nature (LeMenager 2014, pp. 103–106). The extraction of crude oil, dubbed petroviolence, has been affecting humans and the non-human (land, water etc.) for generations, but its impact will extend into the future (Iheka 2020, p. 71). Iheka ties the concept of pretrauma, or trauma of the future, with an ecological disaster connected to the extraction of oil (Iheka 2020, p. 91). Echoing LeMenager's concerns about the reliance of media (print and audiovisual) on energy derived from oil, he posits that criticism of petrocultural modernity cannot be expressed from a position external to it (Iheka 2020, p. 91). For Timothy Morton, climate change, and the ubiquitous radioactive plutonium, are hyperobjects: entities with such a long duration, spatial distribution, and multi-dimensionality that they defy perception and comprehension (Morton 2018). Elsewhere, he argues that the atomic era ushered in a new temporal order, one in which the non-negotiable radioactive half-life of plutonium requires planning for its future storage for as long as 24,100 years. Incidentally, for Morton, this period is roughly the same as that of the early examples of cave art (Morton 2013, p. 121).[4] This timeframe places the burden of moral responsibility for the future on the shoulders of individuals living now, who cannot even fathom the full impact of their mundane decisions (Morton 2013, p. 122). Our imagination now needs to contain deep time, that is to say, historical eras with timeframes extending beyond human perception and well into the past and the future (Carstens and Bozalek 2021, pp. 76–77). Fossil fuels might be a perfect example of objects which actually link distant temporalities: from their creation out of organic matter in deep time to their combustion in the industrial era. Regarding uncertain futures, a wholesale transition to a then-new energy regime (i.e., machines fueled by coal) is a perfect example of path dependencies in which a seemingly insignificant cause has an outsized effect on the future (DeFries 2021, p. 152). Path dependencies introduce an element of inaccuracy into predicting the future (DeFries 2021, p. 152). By bringing temporality into focus, *Dark* is an environmental drama in which human and non-human actors converge. As a temporal phenomenon, cinema helps to understand the nature of time better (Ivakhiv 2013, p. 305). Despite an impression that ubiquitous drone shots of the forest around Winden may simply extend the running time of the series, nature offers a background to time travel. Typically, grief felt in response to the degradation of the environment fails to account for non-human losses in "animal, vegetal, and mineral bodies" (Cunsolo 2017, p. 170). Mourning for Anthropocene-induced losses involves a reckoning with human agency in causing this crisis, especially when changes introduced now may prevent or mitigate losses in the future (Cunsolo 2017, p. 183). The vibrant greenery of Winden's forest may suggest the resilience of the natural world but it also serves as a melancholic prefiguration of the apocalypse.

Katarzyna Więckowska identifies two positions regarding the cultural role of apocalyptic stories: a disarming reconciliation with the seemingly irreversible course of the Anthropocene and "cautionary tales of different, non-apocalyptic futures" (Więckowska 2022, p. 107). In early science fiction, the future had the status of something knowable

and its scientific contemplation invited ethical considerations (Cole 2020, p. 152). For H.G. Wells, the weight of the imagined future could not be overestimated (Cole 2020, p. 151). His visions were either utopian or dystopian, or else merged the two (Cole 2020, p. 153). The ubiquity of post-apocalyptic fiction is pessimistically acknowledged as a counterproductive cultural work, sabotaging the reckoning with "global inequity and ecological destruction" (Payne 2020, p. 1). In *Dark*, the post-apocalyptic world with its social order based on violence is not an end in itself but rather an impulse for the protagonists to double down in their efforts to prevent the apocalypse from happening. In the post-apocalyptic future, the former nuclear plant is a no-go zone protected by armed insurgents as this source of energy is, at the same time, the reason why the old world ceased to exist.

What does cinema have to say about the above considerations? *La jetée* (Marker 1962)—Chris Marker's meditation on time travel as a remedy to being trapped in a post-nuclear apocalypse—is a tour de force. In the wake of World War Three, a group of survivors serve as lab rats in psychological experiments carried out in an underground concentration camp, to train them for living in the future. The main protagonist stumbles in his attempts to save humanity by traveling to the future, instead finding himself in the awkward position of himself as a child, witnessing his own death as an adult. However, the only time machine shown in this film is a syringe with a mnemonic drug. Thus, time travel is a mental endeavor rather than a bodily movement between different moments in time.[5] More recently, Christopher Nolan portrayed the future as being at war with the late modernity of the twenty-first century regarding the destruction of the environment. In a series of spectacular time reversals, the protagonists in *Tenet* (Nolan 2020) battle it out for the sake of future generations whose lives will probably be ruined by the excesses of late modern lifestyles. To compound the effect of the defamiliarization of time, characters move backwards in time—a visual convention harking back to the origins of cinema (Quinn 2022, p. 89).

### 3. The Temporality of Trauma

In psychoanalytical theory, trauma is constituted by its unexpectedness, which in turn forces the subject to perform hermeneutic work on the conscious or the unconscious level. Additionally, trauma "undermines the linear flow of time [. . .] creating a sense of a foreshortened future" (Coe 2018, p. 25). In theoretical discourse, one can observe two major approaches to the temporality of trauma: posttraumatic echoes of a traumatic stressor (a train accident, shell shock, historical traumas such as the Holocaust, etc.) and ongoing traumatization dubbed insidious trauma (Brown 1995, p. 107). The former manifest themselves as involuntary memories, flashbacks, and other symptoms keeping a suffering subject in the past. However, psychological therapy may bring closure to them once the original injury has been successfully grieved. The latter approach, meanwhile, makes recovery almost impossible as the source of trauma is structural, and therapy is largely helpless in dealing with it.

Science-fiction literature may seem an unlikely genre for a serious discussion of psychological ailments, but literary scholars have already devoted much study to such representations of psychological trauma. Time travel in Kurt Vonnegut's *Slaughterhouse Five* sheds light on a possible "temporal phenomenology" of psychosis (Flexer 2020). There is a danger of misattribution as Flexer warns that the extant literature tended to attribute psychiatric labels on the novel's main protagonist Billy Pilgrim—a survivor of the fire-bombing of Dresden in the final days of World War Two—based on the perception of his behavior in the light of known posttraumatic symptoms (Flexer 2020, p. 449). In addition to expanding the notion of trauma to future events, an effort has been made to extend the horizon of trauma into deep time (rather than confining it to the modern period) by applying it to Lascaux cave paintings—depicting hunting—as a visual record of human cruelty to animals (Stiles 2016, p. 9). There are two animal species affected by an energetic anomaly of time travel in *Dark*: birds falling dead from the sky and sheep.[6] Interestingly, the noise emitted by the wormhole in the caves in Winden is inaudible to humans but bursts the eardrums of birds and sheep. Reinvigorating the concept of trauma requires

widening its interpretative angle by abandoning the anthropocentric bias and embracing the socio-ecological surroundings of human existence. Such a new-materialist position accounts for the complexity of planetary existence (Ibrisim 2020, p. 230). Abandoning the earlier approach of "psychologically-oriented trauma theory", treating a survivor as a monadic individual tasked with working through their trauma, opens the door to a more inclusive reading in which trauma is observed at the intersection of the "human and non-human worlds" (Ibrisim 2020, p. 233). Stef Craps points out that the recognition of a psychological burden caused by environmental degradation has prompted academics to come up with a variety of terms to describe this new condition: "solastalgia, ecological grief, ecosickness, Anthropocene disorder and pre-traumatic stress disorder" (Craps 2020, p. 276). Such semantic productivity stems from the realization that trauma studies should be re-oriented to account for future disasters (Saint-Amour 2015). Simultaneously, this shift requires the rejection of anthropocentric privilege, and that we account for future injury.

Antonio Traverso and Mick Broderick identify the depoliticization of the notion of trauma—stemming from its medical and psychological provenance—as a key weakness of trauma studies (Traverso and Broderick 2011, p. 9). Understandably, acknowledging a traumatized individual and their suffering is a commendable goal, but it tends to overshadow any representation of socio-historical phenomena (Traverso and Broderick 2011, p. 9). The field of trauma studies was first corrected by questioning its naive generalization of Western psychoanalysis as a universal therapeutic tool by highlighting other, non-Western approaches to psychological wounds (Craps 2008; Eaglestone 2008; Broderick and Traverso 2010). A major shift in the perception of the temporality of trauma is associated with major hurricanes and international terrorism at the beginning of the new millennium, with Jacques Derrida identifying a yet-to-come trauma with the attacks on the World Trade Center in 2001 (Iheka 2020, p. 82). There is an affinity between the concepts of post-apocalypse and trauma (Teittinen 2020, p. 349). Teittinen explains the allure of post-apocalyptic fiction in how it bends the present in the light of a disastrous future in order to respond cognitively and affectively to future threats and traumas (Teittinen 2020, p. 349). There are two pivotal human-caused scenarios for the apocalypse: a renewed threat of nuclear terror(ism) and calamitous climate change (Teittinen 2020, p. 351). This type of fiction tends to be labeled as a distraction from real global disasters with much longer timeframes, with a similar criticism leveled at "the traditional and narrow conception of trauma, which focuses on sudden and shattering events at the expense of more slow-burning, structural or mediated traumas" (Teittinen 2020, p. 353). The dropping of the atomic bomb on Hiroshima in 1945 is foregrounded in trauma theory both in theoretical terms (in Robert Jay Lifton's designation of the survivor as someone who escaped death: biological, psychological, or as part of a natural disaster (Lifton 1987, pp. 236–40)) and as cinematographic representation of its aftermath (in Cathy Caruth's reflections on Alain Resnais's *Hiroshima mon amour*) (Caruth 1996, pp. 25–56). Ann E. Kaplan links her concept of climate trauma with petroculture and carbon emissions, calling for a shift "towards *thinking for a (dystopian) future*" [emphasis in the original] as a new goal for trauma studies (Kaplan 2021, p. 386). Symptoms associated with a future-oriented trauma "might include flash-forwards, nightmares, and fear-induced disassociation" which are collectively referred to as Pre-Traumatic Stress Syndrome (Kaplan 2020, p. 82).

The representation of trauma in *Dark* may be seen as a reflection of phenomena theorized in trauma studies. By stressing the fact that trauma persists beyond a person's life, it points to the concept of the intergenerational transmission of trauma, an effect studied in reference to descendants of Holocaust survivors and other victims of trauma. In the context of nuclear energy, somatic aftereffects of trauma may appear long after the initial exposure to radiation, giving a new, sinister meaning to the concept of latency. From a therapeutic perspective, trauma in *Dark* has two forms: an indelible stigma of slow-burning cumulative violence and a violent catastrophe manifesting itself as an effect of the defamiliarization of time. Moving beyond the anthropocentric horizon, the series touches upon violence enacted upon non-human actors (animals and plants) as well as

the traumatogenic potential of the manipulation of matter (radioactive waste stored in yellow barrels). Last but not least, its ingenious defamiliarization of time takes its cues from the handbook of posttraumatic cinema, adapting it to the needs of streaming content. Applying the concept of trauma to unknown events employs an assimilated narrative to represent the unknown (Erll 2020, p. 543). In addition to temporal representations of trauma, *Dark* signals it via some visual clues, e.g., Jonas' neck scar, Adam's scarred body (a consequence of time travel), the black cloud of energy in the power plant, and the barren land in post-nuclear Winden.

## 4. The Confluence of Trauma and Time Travel

H.G. Wells' pioneering foray into time travel, *The Time Machine*, explored "deep time, immense futurity, Darwinian evolution via environmental selection" (Broderick 2019, p. 3). The concept of time travel arose in the nineteenth century as a response to advances in geology and biology, the rejection of religious origin myths, and the unimaginable age of the cosmos (Broderick 2019, p. 4). For Broderick, time travel is currently a mere speculation, but if it were ever to materialize, our remote posterity would already be living among us (Broderick 2019, p. 14). Ironically, the scientific advances of capitalism that hinge on the standardization of time prompted modernist writers to "explore the workings of memory, the pathos of finitude and the intensities of fugitive moments" (Tung 2019, pp. 2–3). What is more, there is a deeper connection between modernism and science fiction as it has generated a defamiliarization of time and engendered a host of seemingly escapist strategies for dealing with capitalism: "conservative pastism, ruptural futurism, timeless spatial form and epiphanic or everyday momentousness" (Tung 2019, p. 5). As a narrative trope, time travel predates H.G. Wells' *The Time Machine*, drawing on ancient storytelling, the Bible, rituals, and myth (Jones and Ormrod 2015, p. 12; Wasserman 2018, p. 1). The reconceptualization of time through a modernist lens as a measurable entity divided into identical units in the late nineteenth century was indispensable for the creation of time travel narratives (Jones and Ormrod 2015, p. 13). Time travel in twentieth-century modernism results in the defamiliarization of time as the medium of our movement, especially when inhuman timeframes are evoked (Tung 2019, p. 169). At the heart of modernism lies a paradox as there is a clash between an inherent ephemerality in modernity's forms and the long-term negative impact it may have on the planet (Tung 2019, p. 171). Framing time travel as a philosophical impossibility does not diminish its appeal as a desirable story and a frequently imagined scenario, both to merely observe the past or to actively intervene in it (Markosian 2020, p. 138). The task of time travel in science fiction is to seek a solution to current tragedies in the future (Tung 2019, p. 8). And yet, time travel narratives are frequently about non-intervention as leaving a mark on the past may trigger "a never-ending and nonsensical loop" (Jones and Ormrod 2015, pp. 15–16).[7] Another outcome of modernist playing with time is the multiplication of time perspectives, that is to say, a "multiplicity of times" (Tung 2019, p. 19). Furthermore, time travel has proved a challenge to conventional logic, and science fiction tirelessly delves into its paradoxes. This intellectual effort is crucial to our thinking about "time, tense, ontology, causation, chance, counterfactuals, laws of nature, explanation, freedom, fatalism, moral responsibility, persistence, change, and mereology" (Wasserman 2018, p. 2).

In this respect, the multiplication of timelines and temporal frames in *Dark* is a generic example of a time-travel narrative. Tackling lofty philosophical questions is given an aura of plausibility by dressing it up in science-fiction garb. This convention also allows for the yoking of seemingly disjunct phenomena, such as nuclear energy and personal responsibility, as well as for visualizing this energy regime as a God particle, a hovering black cloud in the nuclear power plant. When justified in psychological terms, time travel offers the possibility of minimizing regret for things we failed to accomplish in the course of our lives (Gleick 2017, p. 295). It remains to be seen how such a regret should be expressed in relation to a civilizational crisis created by modernity and its energy regimes. In *Dark*, knowledge about time travel sets characters on a path of remorse, albeit one that is

counterproductive and marred by violence. In larger, cultural terms, time travel effectively transforms German modernity into a single era in which there is hardly any progress. Instead, the post-apocalyptic cumulative effect makes itself manifest in a violent fashion.

## 5. Conclusions

Critics warn that whenever Hollywood attacks consumer culture (and, I may add, petroculture), it never leads to an outright condemnation of consumerism as such, only certain forms of it (Beeby 2021, p. 42). Cli-fi cinema faces a challenge: in trying to highlight salient environmental issues, it needs to cater to the sensibilities of the mass audience, securing a return on investment for big budget productions (Murray and Heumann 2016, p. 192). A similar conclusion can be drawn about post-apocalyptic narratives which rarely, if ever, call for a complete overhaul of lifestyles as a precaution against the depicted catastrophe. In this respect, they turn the disaster into a mere spectacle without a call to action. Given the persistence of images of ecological disasters, we have already *seen* "eco-collapse or its aftermath" in horror movies, science fiction, and animations (Ivakhiv 2013, p. 256). In this sense, future destruction is already baked into our visual imagination, a result of cultural conditioning. No doubt the practical implications of this conditioning regarding visual catastrophe require further probing: does it desensitize the audience due to its attractiveness or act as a wakeup call (Ivakhiv 2013, p. 294)? Media representations of ecological concerns may miss the mark when it comes to changing lifestyles (Estok 2020, p. 211).

*Dark* is a story about the devastating effects of personal trauma. In a metaphorical sense, the compulsory circle of failed interventions in the past/future may be seen as a substitute object. Psychologically, it keeps the loss at bay by denying any pain or sorrow. In the series, this investment into rejecting the reality of personal loss has literally world-shattering dimensions. In more general terms, *Dark* places the burden of saving/destroying the world on the shoulders of individuals, pursuing otherwise psychologically laudable goals. In this vein, caring for one's (lost) relatives delivers a devastating blow to the planet, unleashing a catastrophic event of global dimensions. Allegorically and literally, foregoing mourning and keeping the dead alive shields H.G. Tannhaus from confronting the reality of a personal loss. By making *Dark* a family drama, its producers exploit understandable motivations, simultaneously avoiding a political statement about human culpability in destroying the world. Surely, picking a nuclear disaster as *the event* is a shrewd move in making the show an attractive spectacle. Its slow pace—especially the ubiquitous drone tracking shots of the forest—would, however, suggest a more imperceptible change, akin to climate change or a hyperobject. In the series' finale, the rejection of time travel as a substitute object leads to the disappearance of characters entangled in its logic. In a CGI sequence, travelers dissolve into thin air like particles sucked away by a black hole. Surprisingly, their disappearance may remind one of the evaporation of human bodies in direct proximity to a nuclear blast. Interestingly, we never learn about the actual extent of the nuclear accident in Winden as it is unclear whether the survivors stayed there as there was nowhere else to go or because they preferred a known-to-them post-apocalyptic milieu. The series' focus on nuclear families may also hint at the concept of intergenerational justice as an interpretative paradigm.

The novel interpretation of German history in *Dark* covers a period of shifting energy regimes, demonizing nuclear power as a disruptive force in a close-knit community. Unfortunately, the series' convoluted storyline and posttraumatic time loops diminish its chances of delivering an easy-to-act-on political statement. First and foremost, *Dark*—like any other series—is about drawing and retaining audiences. Still, it has managed to channel ecological resistance to a divisive energy regime into a visually attractive form, relying on popular traumatic narratives (missing children, world-shattering grief that denies closure). In this respect, the series plays by the rules of popular trauma culture (Rothe 2011), rules in which the tragedy of others serves the economic interests of the media. Of course, *Dark* is a fictional representation of trauma rather than a mediated testimony of an actual survivor, but it capitalizes on the ubiquity of traumatic narratives in the audiovisual media. The

reworking of traumatic symptoms into a visual form is by now an established set of conventions, allowing the series' creators to create an atmosphere of disorientation. The resolution of trauma in the series' finale frees some characters from pointless repetition while the time travelers cease to exist. Making an individual responsible for saving the world, meanwhile, obscures the necessary social context of human action and therefore cannot be a serious exercise in human freedom (Payne 2020, pp. 24–25). Despite the reservations expressed above, I believe audiovisual media can play a significant role in spotlighting environmental catastrophes. Unfortunately, neither a popular series nor the growing body of work in energy humanities (or eco-criticism and other related fields) are able to solve the myriad crises of energy-hungry late modernity on their own. As a psychological strategy, the all-encompassing pessimism of climate catastrophe may be counterproductive as a political strategy, but it has been naturalized by the creative industries as a visual attraction.

## Notes

[1]　There is an infamous cinematic parallel of actual radioactive dust present on the set of a Hollywood movie, *The Conqueror* (Powell 1956), which eventually led to a high incidence of cancer among the crew, manifesting itself decades after the completion of the movie (Villette 2021, pp. 239–40).

[2]　Searching for missing children lies at the core of another runaway success, namely *Stranger Things* (Duffer and Duffer 2016) (Blank 2022, p. 17).

[3]　This omission was at the request of the streaming platform (Holt 2022, p. 291).

[4]　Truth be told, after this period, plutonium will retain half of its radioactivity, with a need for further storage. Additionally, the dating of the earliest cave art has been considerably pushed back since the publication of Morton's book (Hoffmann et al. 2018).

[5]　In this film, memory is dominated by "techno-politics in search of its own survival, regeneration, and continuation" (Fort 2010, p. 396).

[6]　Birds facing extinction evoke mourning even in individuals who never saw them (Whale and Ginn 2017, p. 99).

[7]　Cinematic time travel has been extensively surveyed (Sherman 2017).

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