




ARTICLE

# Learning to Live-with Climate Change through Film: The Arche-Cinema of *Gummo* as Climating and Becoming-Climate

Joseph Paul Ferguson 

School of Education, Deakin University, Burwood, Victoria, Australia  
Email: [joe.ferguson@deakin.edu.au](mailto:joe.ferguson@deakin.edu.au)

(Received 15 February 2024; revised 11 September 2024; accepted 11 September 2024)

## Abstract

I am a cinematic being of the Anthropocene. As a concerned citizen and environmental educator, I immerse myself in film. *Gummo* is a 1997 film by Harmony Korine that deeply resonates with me as a testament to the capacity and desire for humanity to realise the potential to rise from the epochal fall of the Anthropocene. I propose that my relationship with *Gummo* as arche-cinema is not just a process of watching and interpreting Korine's cinematic world, but also (re)projecting my dreams of a new reality for the whole-Earth ecosystem onto the world-out-there. I suggest that my entanglement with *Gummo* exemplifies my climating and becoming-climate as film in our current human-induced climate crises, and in this way, I argue that I am learning to live-with climate change through film.

**Keywords:** Anthropocene; cinema; climate change; environmental education; film

Before beginning this paper proper, I want to say a few words about the title. The notions of “learning to live-with climate change,” “climating,” and “becoming-climate,” are adopted and adapted from the work of my friend and colleague Blanche Verlie, more specifically her papers *Rethinking climate education: Climate as entanglement* (2017) and *Bearing worlds: Learning to live-with climate change* (2019). While the notion of “arche-cinema” is borrowed from the work of Bernard Stiegler, in particular *The organology of dreams and arche-cinema* (2013), as understood through the translations and interpretations of my friend Dan Ross, whose paper *Moving images of the Anthropocene: Rethinking cinema beyond Anthropology* (2019) I make use of here. In making use of Stiegler's work to understand cinema and the Anthropocene, I do so not only in the footsteps of Ross but also Claire Colebrook (2023), however I don't follow Colebrook's Deleuzian and Bergsonian path (2002), rather opting to frame cinema in the Anthropocene in more purely Stieglerian terms. In doing so, I invoke Stiegler as “before anything else, a philosopher of rising and falling” (D. Ross, personal communication, August 15, 2021), in particular in drawing on *Des pieds et des mains* (2006) of which I am indebted to Ross for providing English translations of pertinent sections. While it is not directly reflected in the paper title, it is also incumbent upon me to highlight that I draw on the work of pragmatist semiotician Charles Peirce (both in primary<sup>1</sup> and secondary sources) to frame what I mean by “we,” “us,” and “I,” which are slippery terms of

<sup>1</sup>Peirce's primary material is referenced in this paper using the standard protocol: CP x.y = *Collected Papers of Charles Sanders Peirce*, volume x. paragraph y.

significant ontological and epistemological import. Needless to say, in utilising the works of these scholars, I activate their ideas in ways that reflect my own opinions and not those of the originators of these ideas. And, “Gummo,” if you’re wondering, is the name of the fourth Marx Brother, and was simply chosen by Harmony Korine as the title of his film because he is a big fan of the Marx Brothers as founding figures in the translation of vaudeville into film form.

*“I see ‘Gummo’ as a true science fiction film in the way it shows a scary vision of the future: a loss of soul, a loss of spirituality. And yet you clearly see all that with very tender eyes.”* **Werner Herzog (filmmaker) discussing “Gummo” with Harmony Korine (its creator) during an interview at the 1997 (August 29 – September 1) Telluride Film Festival, at which “Gummo” premiered.**

*“October is early, but not too early to acknowledge Harmony Korine’s ‘Gummo’ as the worst film of the year. No conceivable competition will match the sourness, cynicism and pretension of Mr. Korine’s debut feature.”* **Janet Maslin reviewing “Gummo” for *The New York Times* on October 17, 1997.**

### I am a cinematic being

For as long as I can remember, I have loved films. Or ‘movies’ as we often refer to them. This is cinema; the world of films within which we immerse ourselves. Currently, we mostly do so in our homes by tapping into the ubiquitous streaming services that increasingly enable us to watch movies wherever and whenever we want. But if you are like me, then you still prefer physical media to streaming services when it comes to watching films; my library of DVDs/Blu-Rays is as precious to me as my library of books. Somewhat surprisingly, despite this ‘cinema of everywhere,’ many of us still savour the experience of ‘going to the movies’ to see films on the big screen; there are few things more satisfying than sitting in a dark and quiet cinema — away from the distractions of our smart phones and other similarly intrusive technologies — and being ‘swallowed’ by the images on the screen. Indeed, for me, this is what cinema is all about, what Maxim Gorsky in 1896 called “the Kingdom of Shadows” (prompted by his viewing in Paris of some of the Lumière brothers’ earliest films).

I see much of myself — and some of you reading these words might feel the same — in Cecilia (Mia Farrow) in *The purple rose of Cairo* (Allan, 1985). The greatest joy in Cecilia’s life is to go to the movies to realise a world that is different from what awaits her outside (the Great Depression), until one day the lead actor (Gil Sheppard, played by Jeff Daniels) in the film she is watching (the titular *Purple rose of Cairo*) literally steps through the silver screen and into her world. This is what it means to form an intimate connection with cinema, to be a cinematic being; ‘this’ world and ‘that’ world coming together. To be sure, I have never witnessed such a dramatic breaking of the fourth wall as that involving Cecilia and Gil, and I do cherish my life outside the screen (unlike Cecilia who really was trying to escape something sinister and find her saviour, as she says to her friend in reference to Gil: “I just met a wonderful new man. He’s fictional. But you can’t have everything.”). Nevertheless, my watching of films has significantly shaped my being.

As I currently exist, this being — this me — is a citizen of the world who is not only deeply concerned about human-induced climate change but who is striving to do something about this crisis (or collection of crises) in my daily life as an environmental educator. My cinematic allies are people like Halla (played by Halldora Geirhardsdottir) in *Woman at war* (Erlingsson, 2018), who sabotages the Rio Tinto aluminium plant in the Icelandic highlands as an act of eco-activism. I live in the Dandenong Ranges on the outskirts of Naaarm (Melbourne), Australia, on the unceded lands of the Wurundjeri people; I am at home existing on this Country with my human and more-than-human kin. I also exist on this land, as well at the Burwood campus of Deakin University (also on Wurundjeri Country), as a Lecturer in Science and Environmental Education who works with pre-service teachers to help them to realise their futures as educators who strive to support

their students to negotiate the unfolding climate crises. All of which is to say, I am a being of the Anthropocene, albeit a very particular being (as we all are).

My aim in writing this paper is to explore my cinematic being in the Anthropocene, to explicate the meaning of cinema to me, here and now, as a member of the Environmental Education community who is committed to challenging the status quo of education by arguing that Environmental Education ought to fundamentally involve film. To do so, I will focus on a film which has a profound impact on me, Harmony Korine's *Gummo* (1997), in particular in terms of how it makes me think and feel about the Anthropocene (and more specifically human-induced climate change). *Gummo* was released on November 24, 1997, just a few weeks before the adoption of the *Kyoto Protocol* on December 11, 1997, and three years before the term "Anthropocene" was established with its current meaning, and entered the global lexicon, by Paul J. Crutzen and Eugene F. Stoermer. I mention these events to point out that *Gummo* was a film of its time yet also ahead of its time in relation to what we know as the Anthropocene, which is to say that it is not only a film of the Anthropocene but also a film about the Anthropocene.

### A difficult path

A slight, and somewhat challenging, detour is required before I properly commence my love letter of sorts to *Gummo*, and this concerns my use of the terms 'we,' 'us,' and 'I,' throughout my story. I do so to minimise potential misinterpretations of my arguments — although, of course, every text is open to interpretation but always within the intended guidelines set by the writer — and to make clear the terminological and thus philosophical ground on which I am standing to view and re-project *Gummo*. My suggestion in this paper about the potential role of film as part of Environmental Education that makes a difference to our being with/in climate (change) is dependent on my exploring this dense philosophical territory. I ask the reader to follow me on this challenging intellectual path because we live in difficult times, and it is therefore necessary to engage with difficult ideas if we are to really do things differently.

To do so, I invoke the objective idealism of Charles Peirce, who was also a strong advocate of the "ethics of terminology" (CP 2.219), by which he means the obligation of anyone seeking to clearly communicate ideas to do so by first clearly defining those terms. In this way, formal language is required to maximise precision of ideas and communication, which is not to say that informal language is not valuable but rather that its role is to help unpack that which is formal (and vice versa). As such, I make use of the formal language of Peirce and philosopher of technics Bernard Stiegler to then enable me to share my cinematic experiences of *Gummo* through informal language that more closely aligns with what it is to watch a film.

The starting point of our difficult philosophical path is Peirce's semiotically perfused panpsychism, which is as follows:

Man is a sign. (CP 5.314)

The one intelligible theory of the universe is that of objective idealism, that matter is effete mind, inveterate habits becoming physical laws. (CP 6.25)

The consciousness of a general idea has a certain "unity of the ego" in it, which is identical when it passes from one mind to another. It is, therefore, quite analogous to a person, and indeed, a person is only a particular kind of general idea. (CP 6.270)

There is much to unpack in these statements, yet we only have scope to touch on some of Peirce's ideas as they relate directly to how I am using 'we,' 'us,' and 'I,' for this is what is most important to what I want to say about film and Environmental Education. In making clear the difference between 'generalising' and 'universalising' for my argument, I draw inspiration from Peircean

scholars such as John Deely (2010) and Susan Petrilli (2017) who have teased apart the general from the individual when it comes to human-being as semiosis. It is essential to make as clear as possible these fundamental distinctions because they underpin the tensions that define our current climate crises, and indeed speak to whether cinema is just a form of entertainment or something more ontologically and epistemically powerful that can contribute to Environmental Education as a radical force for change. For brevity, I present Peirce's objective idealism as discrete dot points, but they play out as indefinite entangled threads in the cosmos.

1. 'Existence' and 'reality' are fundamentally different ontological categories, such that if something exists then it is also real, but also some things are real without existing. As such, that which is real is something that is independent of any particular mind (you or I or they) even if it is of the mind (e.g., 'human' is a construct that persists independent of any particular person or persons thinking about it). In contrast, that which exists is something that is independent of not just individual minds but the entire mental universe (e.g., a film as celluloid is a material entity that would persist, for a certain period, even if all humans disappeared). What this means is that 'human' and 'dog' and 'tree' etc. are not just word categories that English-speaking humans have created to label certain aspects of reality, but that 'human' and 'dog' and 'tree' are really operative in the universe.
2. Individuals are real, such as me (that is the singular person that is Joseph Paul Ferguson), but generals are also real, such as 'human,' even if they are not existent as are individuals.
3. No finite collection of actual individuals can ever exhaust the potentiality of generals in the future. For example, no finite community of humans — even if that is all the humans who have lived and will live — can constitute 'human' as a general that always already was coming to be in the future.
4. Generality is continuous (Peirce's synechism) in the sense that "a continuum is of greater cardinality than any set and contains infinitesimals" (Zink, 2001, p. 303).
5. Matter is a form of mind in that it is the crystallisation/solidification of habits (i.e., likelihood of acting/reacting in particular ways in all particular future circumstances).
6. An individual (including a specific human), as the particular manifestation of a general, is a bundle of various sign forms.

Now, in order for Peirce's metaphysics to sensibly inform my notions of 'we,' 'us,' and 'I,' then it must be framed in terms of his account of science as the method of inquiry that enables the establishment of truth (the object of which is reality). As an environmental educator, I highly value (but not in an exclusive way) the epistemic and methodological insights of (Western) science. Peirce was firstly a scientist but foremost a logician. He defines truth as the final opinion (i.e., set of habits) that the infinite community of inquiry will converge on in the infinite long run. Critically, this infinite community of inquirers is not limited to humans but extends to all possible entities capable of semiotic activity; what Peirce refers to as the "quasi-mind" (CP 4.536). As such, we may consider Peirce's panpsychism also as "pan-species realism" (C. Legg, personal communication, April 20, 2023) and as such aligned with post-humanist Environmental Education which values the more-than-human just as much as the human, particularly in the context of the climate crises (Ferguson & White, 2024). This is Environmental Education as Climate Change Education, which gives us hope.

So — and this is really important — in this paper, 'human/humans/humanity' as well as 'we' and 'us' is used in a *generalising* way (as in a general) and not in a *universalising* way. As such, 'human/humans/humanity' does not mean the collapsing of all particular groups/communities/nations of people into a homogenous whole that disregards critical differences of experience. Indeed, these are the notions and processes that underpin the inequity of our current situation, and which have no place in justice-oriented Environmental Education (Trott et al., 2023). Rather, 'human/humans/humanity' means the general category of 'human/humans/humanity,' that is

(again following Peirce) semiotic entities capable of reasoning to form arguments as a particular meaning making process, who are also especially capable of generating and engaging with cinematic forms. Similarly, 'we' and 'us' does not mean that I am speaking on behalf of all particular groups/communities/nations of people, but rather 'we' and 'us' means the infinite community of inquiry (the quasi-mind) that is made up of generals (for example, 'humans' but also entities capable of semiotic activity that are yet to be). Again, this is Environmental Education as multispecies justice (Tschakert, 2020), in other words Climate Change Education. And, finally, 'I' is used in an individualising way to mean the particular kind of general idea that is Joseph Paul Ferguson (a specific manifestation of 'humanity').

To summarise; 'human/humans/humanity' and 'we' and 'us' are real generals but not existent individuals, while 'I' is an existent and thus real individual. I therefore implore the reader to cast off the shackles of nominalism (i.e., denying that generals are real and reducing reality to a collection of existent individuals) and to engage with my text as a realist (i.e., acknowledging the general and individual nature of reality). I call this 'realist Environmental Education,' similar to Parker's (1996) "environmental pragmatism" (p. 21), and suggest that any nominalist framing of Environmental Education is limited in valuing the whole-Earth ecosystem such as it is fixated on the individual human. Similarly, nominalism undermines film as a fundamental of human existence, with a realist framing in contrast making possible the notion of cinematic being. Only by embracing this realism will the generalising, and not universalising, intent of my story be realised by writer and reader alike, which is essential to understanding my relationship with *Gummo* and my advocating for film as offering much to Environmental Education in reshaping 'being in the Anthropocene'. So, now to return to our cinematic focus, but always with this realist Environmental Education in mind.

### Cinema in the Anthropocene

What we know as cinema is part of what we know as the Anthropocene; in a sense all cinema is cinema of the Anthropocene, not just those films that explicitly deal with the climate crises and associated perturbations (you may know these as climate fiction, or cli-fi). As Jennifer Fay (2018) points out in her book *Inhospitable world: Cinema in the Anthropocene*:

Like the effects of the Anthropocene in many accounts, cinema is also a product of the Industrial Revolution and arises out of a desire for the preservation of life, a sense of mastery over time and space, and what Marshall McLuhan called "the extensions of man." (Fay, 2018, p. 4)

I use Anthropocene here in the sense outlined by Dan Ross (2019) in his paper *Moving images of the Anthropocene: Rethinking cinema beyond Anthropology*:

The Anthropocene is an idea. It is the idea that in the long (or short, if one's timescale is geological) history of the relationship of humankind to its milieu, a shift has occurred, so that humanity has now become a decisive factor in the transformation of geophysical systems, which is to say geo-biochemical systems. (Ross, 2019, paragraph 3)

But Ross goes further than the notion of the Anthropocene as an idea:

... the Anthropocene is the name not just of an idea but of a problem: the problem of whether it is still possible to have good dreams or to realize new dreams, after the recognition that we ourselves, the anthropological beings that we have taken ourselves to be, the beings for whom being is a question, are in fact the planetary question. (Ross, 2019, paragraph 4)

Bernard Stiegler (2013) points out in his paper *The organology of dreams and arche-cinema* that cinema is one particularly powerful way that humans have and will continue to dream. Films were a contributing factor getting us into this mess, but they might also offer us a way out of our current predicament through “cinematic dreaming” (Ross, 2019, paragraph, 44). If this is the case, then film ought to be a fundamental part of Environmental Education.

At this point, I want to say something brief about the second law of thermodynamics, for we need to acknowledge the entropic nature of the Anthropocene. So, we must momentarily return to that difficult philosophical path that we traversed earlier, but this time the focus is Stiegler and not Peirce. *Entropy* is the increasing disorder of a closed system, or in other words increasing chaos (i.e., energy quality decreases). Not only was this second law of thermodynamics necessary to developing and understanding the functioning of the internal combustion engine — that great driver of the Industrial Revolution — but as Ross (2019, paragraph 6) makes clear, a Stieglerian framing of the Anthropocene is defined by “following the second law of thermodynamics all the way out to the end.” In other words, the Anthropocene is the epoch of probabilistic calculability, a time/place in which the calculable dominates everything by obliterating singularities (Ross, 2019). In order to change our current state, in order to realise what Stiegler (2018) calls the “Neganthropocene” — that is an epoch which embraces the incalculable through differentiation that realises bifurcations of ordering — then we need to rally any and all negentropic forces (i.e., counter-points to entropy). *Negentropy* is thus the ordering of chaos, the establishment of increasing order in a system (and the universe more widely). To frame this in Peircean terms; while homogeneity (i.e., universalisation) might be contrasted with differentiation, it is the case that differentiation is part of generality in that it is when chaos/chance is subjected to generality that differentiation as bifurcations becomes possible. Negentropy necessarily involves entropy in that for generality to be operative in a synechistic universe (i.e., continuity) it needs chaos/chance to go to work on to make possible singularities as bifurcations resulting from purposeful differentiation.<sup>2</sup> Film has historically contributed to this entropy, but since its birth has also always harboured great negentropic potential (Ross, 2019). Similarly, what I hope for in Environmental Education as Climate Change Education — and what I am attempting to outline in this paper — is education as a negentropic force (Bradley, 2020, 2022), which can empower us to be with/in climate (change) in ways that make for more desirable futures (Forrest, 2022). Film as part of this Environmental Education can therefore help to push back against the entropic tendencies of education, which are entangled with the broader entropic processes of human-induced climate change.

To return to Gorksy in 1876 and his experiences of the Lumière Cinématographe for a moment, Fay (2018, p. 3) suggests that: “For Gorksy cinema is a new instrument of the Industrial Revolution that revives supernatural experience . . . . the cinematograph forecasts the grim fate of the human and the natural world in the industrial age to come.” The situation is no different now in the third decade of the 21<sup>st</sup> Century, except that we (unlike Gorksy) are now living that nightmare and we are increasingly doing so with cinema not as film — as in celluloid — but cinema as digital data. Whereas movies used to be shot on film and projected as film, nowadays movies are primarily shot digitally and similarly projected, with most viewing of movies now taking place ‘online’; “. . . everyone is perpetually before a screen, a screen that gives them the whole world, that supplies, feeds, distorts and exploits every dream and every fantasy” (Ross, 2019, paragraph 10). And just as the shift from shooting on location to shooting on sound stages was a signal of our intention to better control nature through/as film, this shift from celluloid to digital data in both the production and consumption of cinema marks a material and indeed spiritual schism between human and the cinema-mediated ‘world-out-there.’ “I take the ambition,” Fay

<sup>2</sup>As Reynolds (1996) makes clear, Peirce was evidently not aware of the perceived tensions between his account of the universe as decreasing in entropy (with Peirce arguing for increasing generality) and the second law of thermodynamics (i.e., increasing entropy as the universes evolves). This is an issue far beyond the scope of this paper, but nevertheless is worth keeping in mind as part of Peirce’s objective idealism.

(2018, p. 9) says, “of film production as a fitting (if only partial and certainly perverse) description of how the Anthropocene answers a wish for a human-made and manipulated planet.” I would argue that what Fay says here about film production applies just as much to film consumption.

Scott Macdonald (2004, p. 109) says as much in his paper *Toward an eco-cinema*, as he discusses our 21<sup>st</sup> Century cinematic habits: “We often think of distractions as a slowing down, a release from the demands of our busy schedule, but going to the movies (and watching television) increasingly means an acceleration in our rates of consumption.” And the Anthropocene is nothing if not the epoch of human consumption. It’s worth noting that Macdonald made this statement in 2004, well before the rise of the streaming services that now completely define many people’s cinematic experiences. Indeed, I would go so far as to argue that in many cases people don’t so much *watch* films on streaming services so much as they *consume* these streaming services. This potentially pernicious form of ‘online cinema’ is what Derakhshan (2015) calls the “Stream.” MacDonald (2004) continues:

And, of course, much of what we’re looking at and hearing is little more than an on-going, implicit/explicit polemic for still more extravagant levels of consumption . . . the ever-higher levels of consumption polemicised by popular media place our natural resources, and what remains of something like original nature, in ever-greater jeopardy. (Macdonald, 2004, p. 109)

To be sure, there are streaming services such as *Kanopy*<sup>3</sup> which democratise the movie going experience by providing the public with access to films that they can watch in the ‘cinema of the home.’ Such community-oriented streaming services could indeed play an important role in film as part of Environmental Education as they make climate-related stories (potentially from diverse voices) available to the public. However, most streaming services are potentially anti-cinematic in that they position us to consume films — like junk food — as we do when we ‘plug’ ourselves into *Netflix* (or *Disney+*, or *Amazon Prime*, the list goes on . . .). In doing so, we are at risk of watching that which we do not really want to watch but are programmed to do so by the streaming services, but all the while under the illusion that we are still in control. And, this is a matter of desire and attention, for as Ross (2019) makes clear the forces of the Anthropocene (including the Stream) are those which short-circuit our desires and corrupt our attention, so that they are not our desires at all, but rather wants programmed into us to perpetuate the production/consumption cycle. Similarly, education in its entropic forms is a force, as Stiegler (2010a, 2010b, 2010c) makes clear, which often contributes to these processes of short-circuiting and corrupting, which understandably concerns us as environmental educators. To be clear, ‘desire’ for Stiegler and Ross is a psychoanalytic phenomenon which concerns our relationship with the future: “As libidinal energy, desire is produced by that apparatus that transforms the drives into investments in objects” (Stiegler, 2011, p. 156), such “desire is protention — an infinite investment in its object” (p. 159). So, desire is a question of detaching drives from some aims and reattaching these drives to other aims (Ross & Bradley, 2024, unpublished). And as Fitzpatrick (2020, p. 354) points out, ‘attention’ in Stiegler’s account is closely linked with desire via memory: “Attention, for Bernard Stiegler, is linked to modes of retention or to put it simply, modes of memory and the distinction between true memory and regurgitation memory are linked to modes of attention.” Stiegler (2010c) asserts the generative relationship between *anamnesis* (recollection by the mind, “living memory”) and *hypomnesis* (recollection as exteriorised, “dead memory”) in defining our attentional potentialities. Education, including what we want Environmental Education to be, is always tied up with desire and attention, as is the case with film.

<sup>3</sup>*Kanopy* is an on-demand streaming video platform for public and academic libraries that offers films, TV shows, educational videos and documentaries. The service is free for users, but content owners and content creators are paid on a pay-per-view model by the institution.

In this way, streaming is the new television; the Stream is a significant contributing cause of the “destruction of the right to and possibility of dreaming” through/as film (Ross, 2019, paragraph 47). In contrast, going to the movies, or choosing to watch a particular film on *Kanopy* or physical media at home, seems to retain its almost magical capacity to enable us (even if only for an afternoon or evening) to realise our full cinematic being. To be clear, I am not intending to invoke cinema here in a nostalgic sense — it is not a matter of simply romanticising the cinema of the past — but rather I am yearning for an authentic form of cinema that is full of arche-cinematic potential. It is this version of cinema that I suggest has much to offer Environmental Education in the Anthropocene.

All of this is to say that we must not forget that cinema is a “pharmakon” (Stiegler, 2013); it is poison, remedy, and scapegoat. So, even in the increasingly diminished form of the digital film, “cinema helps us to see and experience the Anthropocene as an aesthetic practice” (Fay, 2018, p.4). As long as we can make decisions about what we want to watch and how, then cinema can be a force for good in the Anthropocene, it can be an “eco-cinema” (Macdonald, 2004, p. 109) which is full of negentropic potential (Ross, 2019). That is, cinema which opens possibilities to doing things differently and purposefully as against the entropic forces of chaos of the Capitolocene (Stiegler, 2013). In the words of Macdonald (2004):

I see the fundamental job of an eco-cinema as a retraining of perception, as a way of offering an alternative to conventional media spectatorship, or to put it in terms I’ve explored in detail elsewhere, as a way of providing something like a garden — an “Edenic” respite from conventional consumerism — within the machine of modern life, as modern life is embodied by the apparatus of media. (Macdonald, 2004, p. 109)

What we ought to strive to do in being cinematic is to intentionally choose what to watch, and in so doing take up the right and responsibility to cinematically dream, and to desire and pay attention. I suggest that this eco-cinema needs to be part of the Environmental Education that we enact with our communities in striving to ‘be’ in different and new ways, which is to say Environmental Education as (cinematic) dreaming in the Anthropocene. Now it is time for me to focus our attention and desire on *Gummo*.

**“Life is beautiful. Really, it is. Full of beauty and illusions. Life is great. Without it, you’d be dead.”**

As is evident from the two quotes that begin this paper, upon its release in 1997, *Gummo* was both loved (the quote from Werner Herzog) and loathed (the quote from Janet Maslin). And the situation is no different today. *Gummo* was the creation of Harmony Korine, who wrote the screenplay for the infamous *Kids* (Clark, 1995) when he was just 19 years old and shot his debut feature film *Gummo* (with Jean-Yves Escoffier as cinematographer) when he was the relatively young age (when it comes to moving making) of 23. Most of the people appearing in the film are local non-actors from Korine’s hometown of Nashville, Tennessee (where the film was shot on location), apart from Chloë Sevigny (who appeared in *Kids*) and Linda Manz (who had prior film credits, including Terrence Malick’s *Days of Heaven* in 1978). From all reports, including from Korine himself, the shooting of the film was somewhat haphazard with a spirit of spontaneity embraced by all on set, with Korine working with editor Christopher Tellefsen to weave this footage with other video/audio material that Korine sourced from elsewhere (e.g., video tapes from friends) to create a finished film. It would be accurate, therefore, to describe Korine, at least the 1997 version of Korine, as a negentropic director in that he sought out and fostered the ordering and differentiation of his film-to-be by shaping chaotic cinematic encounters into a collection of singular cinematic moments.

During the promotion of *Gummo*, Korine appeared on *Late show with David Letterman* on October 17, 1997. It is worth noting that Korine appeared on this programme multiple times, and



each time he befuddled both Letterman and the studio audience as well as viewers at home with his twitchy seeming-to-be a stoner persona who was actually a highly original filmmaker with a true appreciation of the history and transformative power of cinema. Not surprisingly, television, that great disruptor of our attention and desires, did not ‘get’ what Korine was all about when it came to *Gummo* (nor for that matter with anything associated with Korine at the time). I provide these insights into Korine, the iconoclastic filmmaker, because a film is always an extension of, and indeed part of, the filmmaker; one must give part of themselves to make a meaningful film, whether you are a director or actor. As environmental educators, we know well that to make a difference in this climate-ravaged world that we must always give part of ourselves for the benefit of the (whole-Earth ecosystem) community.

While appearing on *Late show with David Letterman* to discuss *Gummo*, Korine was asked by Letterman what the film was about, with Letterman suggesting that perhaps it was autobiographical (Letterman also mockingly said, “It’s like nothing I have ever seen before.”). This was Korine’s reply:

Not really, it’s more about specific scenes . . . I wanted to make a different film. I wanted to make a different kind of movie, because I don’t see cinema on the same terms, or the same way that narrative movies have been made for the past 100 years. I mean we started with Griffith, and we ended up with, I don’t know what the hell is on now. But basically, nothing has changed. I want images coming from all directions.

This again is Korine as the negentropic director, who pushes back against forms of cinema which dull both our desire and attention; making films for Korine is about realising bifurcations. Films as linear narratives made up of predictable sequences of fundamentally purposeless images and sounds — what filmmaker and media analyst Peter Watkins (2018) calls the “Monoform” that underpins “mass audio-visual media” — are dangerous in their entropic potency, and so Korine acts to oppose these forces.

To return to *Late show with David Letterman*, Korine was next asked by Letterman to explain what story he was telling with *Gummo*, with Korine replying:

It’s not really one story, because that’s the whole thing, I don’t care about a “story,” about plots . . . I think every movie there needs to a beginning, middle, and end, but just not in that order.<sup>4</sup> And at least when I watch movies, the only thing I really remember are characters and specific scenes. So, I wanted to make a film that consisted entirely of that. Really random.

What Korine means here by “really random” is that he was open to embracing chaotic cinematic encounters that he could then go to work on to shape into a collage of singular cinematic moments. It is almost as though Korine (at least the young 1997 version, he might think differently now) misidentifies as an entropic director when he is evidently a negentropic film maker. With this consideration of Korine’s approach to filmmaking in mind, we can say that to watch *Gummo* is not to construct a distinct audio-visual narrative out of connected scenes, but rather to have thoughts and feelings impressed upon you that are particular to certain scenes. In this way, the scenes in *Gummo* don’t really hang together in any linear sense, but rather it is the thoughts and feelings — the viewer’s impressions — that come together to enable a consummation of cinematic experience. There is no ‘right’ or ‘wrong’ way to watch *Gummo*, it is open to the discretion of the viewer who can make of it what they will. As such, Korine respects the agency of the viewer, just as we always endeavour to value and foster the agency of those we work with in making Environmental Education into Climate Change Education.

<sup>4</sup>Korine borrows this famous line from French New Wave pioneer Jean-Luc Godard.

Having said all of this, it is possible to paint a broad-brush stroke picture of *Gummo* by saying something about the setting of the film and the main characters. Any attempt to present and analyse scenes is of questionable purpose, however as I will show shortly, it is possible to share my impressions of certain scenes and in turn to analyse these impressions. The film is set in a fictionalised version of Xenia, Ohio, U.S.A., in the aftermath of a tornado that has killed and damaged many humans, more-than-humans, as well as material infrastructure. The film focuses on the children, young people, and young adults, who inhabit this post-apocalyptic world. The protagonists are Soloman (Jacob Reynolds) and Tumbler (Nick Sutton) who spend most of their time hunting feral cats to sell to the local grocer, as well as indulging in various other types of seemingly deviant behaviour. Soloman's mother (Linda Manz) exhibits a curious form of tough love for her son. Three sisters — Dot (Chloë Sevigny), Helen (Carisa Glucksman), and Darby (Darby Dougherty) — stave off boredom by caring for their domestic cat Foot-Foot. All the while, Bunny Boy (Jacob Sewell) wanders aimlessly around town encountering the local inhabitants.

### Rising and falling in Xenia, Ohio

It is now time for me to share with you what *Gummo* means to me as a vegetative, sensitive, and noetic soul of the Anthropocene. I will attempt to analyse my impressions of the film, to explain why it resonates with me, with the aim of showing what potentially transformative role film might play in Environmental Education. *Gummo* makes me feel simultaneously sad and hopeful, while confusing me but also granting me clarity of thought on urgent matters. A beautiful sadness, a nostalgia. It is this mixture of contrasting feelings and thoughts that leads people, including myself, to describe *Gummo* as a 'weird' film as we grapple with the ineffable. I experience these feelings and thoughts in a heightened sense when immersing myself in the penultimate rain-soaked act of the film (on the following page is a montage of shots from this act, which are the property of Harmony Korine and presented in this way under fair dealing for the purposes of criticism and review) which is set to Roy Orbison's *Crying* (on the following page, with these song lyrics the property of Roy Orbison and Joe Melison and presented here in full under fair dealing for the purposes of criticism and review). Soloman and Tumbler are depicted shooting and stepping on a dead Foot-Foot (Shot 2), as interspersed with footage of a tornado destroying a town (Shot 3), while Bunny Boy cavorts with Dot and Darby in a swimming pool (Shot 1), all of which is brought to a close with Bunny Boy running towards the camera through long grass to break the fourth wall at close range as he holds up the dead Foot-Foot (Shot 4). This sequence of events — a set of discrete moments that is thrust upon the viewer by Korine — is representative of the film as a whole, albeit in a concentrated form. This is the Harmony Korine of 1997; this is the heady experience of watching *Gummo*.

In order to make sense of why this scene moves me so much — particularly as an environmental educator — I return to the earlier quote from Herzog, repeated here for clarity and impact.

I see "Gummo" as a true science fiction film in the way it shows a scary vision of the future: a loss of soul, a loss of spirituality. And yet you clearly see all that with very tender eyes.

I see reflected in these words of Herzog, my thoughts and feelings about *Gummo*. But that is not enough as Herzog seems here only to be scratching at the surface of *Gummo*; the depths of *Gummo* and by extension the true nature of Korine the filmmaker, and what he potentially means to cinema in the Anthropocene, remains hidden. So, I turn to Bernard Stiegler's *Des pieds et des mains* (2006) — a philosophy lecture (and Q&A) that Stiegler presented to a class of children in France — to argue that what Herzog is really trying to say and what *Gummo* is really about (at least for me) is the *rise and fall of humanity*. As such, another short detour from the specifics of *Gummo*, is necessary; another return to that difficult, but enlightening, philosophical path.



***Crying (Roy Orbison & Joe Melson, 1961)***

*I was alright for a while, I could smile for a while  
Then I saw you last night, you held my hand so tight  
When you stopped to say, "Hello"  
You wished me well, you couldn't tell*

*That I'd been crying over you  
Crying over you then you said, "So long"  
Left me standing all alone  
Alone and crying,*

*Crying, crying, crying  
It's hard to understand  
That the touch of your hand  
Can start me crying*

*I thought that I was over you  
But it's true, so true  
I love you even more than I did before  
But darling what can I do?  
For you don't love me and I'll always be*

*Crying over you  
Crying over you  
Yes, now you're gone  
And from this moment on  
I'll be crying, crying, crying, crying,  
Crying, crying, over you*

Stiegler (2006) proposes to this audience of children that philosophy helps us to understand who we are, which is difficult work but necessary for us to flourish. He goes on to say (keeping in mind that *man* here means *human* in the general Peircean sense):

Since the beginning of humanity, man has wanted to rise. Even when he did not know how to make arrows, man wanted irresistibly to raise himself. What drives man is the desire to rise higher and higher . . . To climb is to aim for something high, and therefore difficult to reach. Things of value are difficult to achieve . . . Man, in the course of his very long history, has experienced this type of difficulty: he has had to raise himself and he finds that it is essentially in doing so that he finds his happiness. (Stiegler, 2006, p. 23)

So, what makes us human, what makes us who we are, is not only our capacity but also our desire to rise, to do those difficult things that satisfy our vegetative, sensitive, and noetic souls. It is imperative to point out here that what Stiegler means by rising is not (for example) the proliferation of automated industries and the development of digital technologies that make our lives easier and superficially more enjoyable. These are key markers of the Anthropocene, and indeed forces that we attempt to resist in enacting Environmental Education. Rather, Stiegler is insisting on the complete opposite; rising must be a negentropic process, the reestablishment of our *savoir vivre* (how to live), *savoir faire* (how to make and do), and *savoir théoriques* (how to think). This for me is what Environmental Education as Climate Change Education is all about.

However, this is far from the full story of humanity, for as Stiegler (2006) goes on to say:

Yet at the same time, I believe that in general, and especially these days, man has a tendency to fall. He has risen a great deal over millions of years, he has never stopped ascending, but he no longer knows how to keep going; it is as if he has reached the ceiling, which means a limit, and as if he was going to fall back down even lower than on the first day of his elevation . . . (Stiegler, 2006, page 27)

So, our capacity and desire to rise is counteracted by our propensity to fall; to stop doing those difficult things that make a real difference to humanity (and indeed the whole-Earth ecosystem). Right now, in the Anthropocene, we are in free fall, we have or will soon hit rock bottom. We seem stymied by limits everywhere we turn (both self-imposed and enforced from without). Indeed, my motivation in writing this paper is to point to film as potentially a force to challenge these limits as we strive to do Environmental Education in radical ways. It is imperative to point out here that Stiegler does not use 'rise' and 'fall' in the tradition of white Christianity to define humanity. Rather, Stiegler follows Peirce in using these terms to refer to 'humanity' as a general that has great capacity to contribute to the infinite community of inquiry, but which also has a tendency to disintegrate into individualism. I prompt the reader here to recall my earlier focus on realist Environmental Education. Thus, 'Anthropocene' in this way refers to the epoch defined by this tension between the potential 'good' of humanity as a general and the potential 'bad' of individual people.

I want to reassure the reader that in adopting Peirce's and Stiegler's ideas in this way, I am certainly not disputing the injustices of the multiple crises of human-induced climate change; those who have least contributed to this problem and who have the least formal power to take action are the most impacted by these catastrophes (Amorim-Maia et al., 2022; Mikulewicz et al., 2023). In other words, it is White privileged men who have unleashed the most potent entropic forces on the planet. However, my focus in this paper is not discrete groups of people, but rather humans as a general which transcends but does not eliminate the individual; generality does not mean the absence of individuality. It is this sense that I talk of the rise and fall of humanity, which by focusing on the general opens the possibility of realising a pan-species future. And to reiterate my earlier point, this particular possibility for the future is aligned with our hopes for Environmental Education as properly post-humanist.

Stiegler (2006) offers us hope, but only if we can muster the capacity and desire to rise to the occasion:

... man must make a leap, break through the ceiling, overcome a limit ... But to make this leap, if ever he has to make it, and if he can, my belief is that he must first learn to fall ... the one who rises up risks falling, so he must learn to fall in order to be able to rise again if he does fall ... But if you must learn to fall, you also have to learn to know your limits (Stiegler, 2006, p. 27).

So, paradoxically, it is in falling and appreciating that we are falling that we can realise our potential to rise, to overcome our limits, to embrace our humanity so we can transcend the individual and realise a pan-species reality. And, the harder we fall, potentially the greater we can rise; from the ashes rises the Phoenix. If, at any time in our history, we needed to rise in this profound way — to learn to know our limits and to surmount these limits — it is now as we experience the full force of the Anthropocene. Environmental Education in our current epoch must therefore be about acknowledging our fall as the impetus for us to rise.

Now, back to film and more specifically to *Gummo*, that scene, and my impressions. I propose that what Korine is manifesting with his film, as I experience it, is the unprecedented fall of humanity that is the Anthropocene. Our penchant for machines and processes that belch carbon dioxide (and other pollutants) into the atmosphere has and continues to (almost) irrevocably alter the homeostasis of the whole-Earth ecosystem. What does this mean? To put it bluntly, it means death and destruction, not just in a physical sense but in respect to all Earthly souls (vegetative, sensitive, and noetic). To me, this profound suffering and loss is what jumps out of the screen and into my heart and mind as I watch *Gummo*. It is explicit in the content of the film; as I watch that penultimate scene, I cannot avoid coming face to face with our failure, I cannot escape the reality of our fall (i.e., the Anthropocene). I thus propose that if Environmental Education as Climate Change Education is to honour our epochal fall and concomitant potential to rise, then we have to turn to film as part of what we do.

Therefore, among all this despair and chaos, there is a glimmer of hope; suddenly differentiation, ordering, and bifurcations seem possible. As the images of *Gummo* strike my eyes and Roy Orbison's *Crying* hits my ears, I sense the capacity and desire for humanity to (almost) miraculously rise, for we have fallen so far. In order to save ourselves, we had to fall this far so that we could overcome the seemingly insurmountable limits of the Anthropocene. This is all in the film, as I experience it. To be clear, this potential to rise is not explicit in the content, rather it manifests in the thoughts and feelings that are impressed upon me by Korine (you could say it is the form of the film). Watching *Gummo* is a unique experience because it conjures in the viewer (at least this viewer) the realisation of the potential for humanity to rise up and out of the Anthropocene, but only in so far as we have fallen this far (i.e., to rise in a fundamental way, we must first have fallen in a profound way). This is what Herzog means when he calls *Gummo* “a true science fiction film,” and I would add a true science fiction film of *the Anthropocene*.

### Arche-cinema of a tornado

Now, I must say something more specific of what my *Gummo* experience means for my being as a concerned citizen and environmental educator in the Anthropocene. To do so, I return to Bernard Stiegler's *The organology of dreams and arche-cinema* (2013) and Dan Ross' *Moving images of the Anthropocene: Rethinking cinema beyond anthropology* (2019). In particular, I want to consider the implications of something I raised earlier in this regard, and that is cinema as dreaming. Ross (2019, paragraph 2) proposes that “there is a sense in which, for ‘us,’ there has never been anything but cinema,” in that our noetic souls consist of moving images of thought. In this way, Stiegler

(2013, paragraph 2) argues that “the dream is the primordial form of this arche-cinema,” with arche-cinema literally meaning the beginning (arche) of cinema. Long before the invention of the cinematograph, people were inscribing images on the walls of caves to manifest and share their dreams (Stiegler, 2013). It is important to remember that Stiegler (see 1998; 2008; 2010b) presents his account of arche-cinema as part of his broader theory of ordinary techniques (viz. *technē*), that is our entanglement with what we call ‘technology’ to live our lives (for better and worse). In fact, Herzog made a film, *Cave of Forgotten Dreams* (2010), precisely about this cinematic heritage as found in the Chavet Cave in Southern France. I would argue that First Nations people were enacting the same practices in Australia thousands of years before these Europeans, and indeed if those who colonised Australia (my forbears included) had paid attention to this First Nations’ cinema, then we would all be in a much better situation today.

We can now more clearly see my earlier comments about us as cinematic beings in a different light; we think and dream in a cinematic way. I’m not just a cinematic being because I have the capacity and desire to innervate my world with the world on screen (and vice versa), but I am a cinematic being (indeed all humans are, in a general sense) in a more fundamental way in that I dream and think as moving images. And it is dreams that have the negentropic potential to bring about new realities — to make singularities possible — as they transcend the probable and embrace the possible.

This realisation of new realities, which is another way of saying overcoming our limits to rise from our fall, can only be more than a solipsistic dream due to the arche-cinematic quality of dreams as projections. As Stiegler (2013, paragraph 31, paragraph 39) proposes, “arche-cinema . . . rests on processes of the projection through montages . . . a projection in the course of which readers, listeners and spectators project their own” desires onto the world. In a very real sense, “we are projectors” (Stiegler, 2013, paragraph 70, paraphrasing Jean-Luc Godard), in that what we experience of films as projections (which emanate from movie theatre screens as well as computer screens) is in turn interpreted and (re)projected onto the ‘world-out-there.’ In other words, our cinematic being “is the exteriorisation of dreams” (Stiegler, 2013, paragraph 77). We must then follow Stiegler (2013, paragraph 36) in appreciating films as “the concretisation of the arche-cinematic power to dream,” to which I would add the potential for Environmental Education to manifest more radical and vivid dreams of desirable futures through this purposeful engagement with film.

Once again, we must now return to my experiences of the tornado in *Gummo* (Shot 3 of the montage) and all my other impressions of the shots in that scene and the movie as a whole. What is the arche-cinema of *Gummo*? I propose that my relationship with *Gummo* is not just one of watching the film or indeed interpreting the film, but also projecting (or re-projecting) my impressions as dreams onto the world outside of the screen. More specifically, what projects from me is a dream of us (i.e., humanity) embracing the epochal fall of the Anthropocene as the turning point in realising our potential to rise into a new being; an alternative Negentropic future. It is in this sense that my being in the Anthropocene as an environmental educator (among other identities) is about being a projector of hope, of dreaming of the rise that must come to be, and embracing film to enliven this dreaming.

### **Climating and becoming-climate as *Gummo*: Learning to live-with climate change through film**

I mentioned my friend and colleague Blanche Verlie in the first few paragraphs of this paper, and it is now time to for me to activate her papers *Rethinking climate education: Climate as entanglement* (2017) and *Bearing worlds: Learning to live-with climate change* (2019). Only by doing so, can I properly articulate the integral cinematic part of my being, in particular as an environmental educator who seeks to model an appropriate form of citizenship for current times.

Verlie argues that in order to enact a form of Environmental Education and indeed citizenship that can make a significant difference to our current plight, then we must acknowledge that “we are part of that climate we seek to understand” (2017, p. 562). We are obligated to understand our entanglement with all the various aspects of the crises of the Anthropocene, as driven by human-induced climate change. “Climate,” Verlie (2017, p. 571) tells us, “is a verb, not a noun, and the subject is always a worldly we — we climate together,” such that we can talk of “climating” (2017, p. 562). As such, “climate education could be understood as processes of becoming-climate” (Verlie, 2017, p. 571).

I argue that in watching, interpreting and (re)projecting *Gummo* onto the world as Negentropic dreams of rising from our epochal fall, I am climating and becoming-climate as *Gummo*. This film is, to borrow Verlie’s words (2017, p. 560), one of the “material-discursive apparatuses” of my teaching/research and being more generally, through which “the climate and the human are contingently, agentially coconstituted.” It is in this way that *Gummo* for me is a negentropic force in an increasingly entropic world. *Gummo* is part of that climate we seek not just to understand but to change in radical ways through Environmental Education.

In concluding, I want to reiterate my statement about the potentially transformative power of cinema in the Anthropocene as exemplified by my relationship with *Gummo* (and by extension with Harmony Korine), and more specifically in relation to Environmental Education. As Verlie (2019) poignantly makes clear, it is not right for us to simply suffer the apparent dire fate of our current situation nor to ignore that our house (i.e., planet) is on fire (literally). Our only option is to engage in “bearing worlds,” that is “enduring the pain of the end of the world they [we] have known, and labouring to generate promising alternatives” (Verlie, 2019, p. 751). This is exactly what I mean, in following Stiegler (2013, 2006) and Ross (2019), when I talk of the arche-cinema of *Gummo* as the (re)projection of a desire to rise from the fundamental fall of the Anthropocene. I can bear worlds with *Gummo*, which is to engage in what Macdonald (2023, p. 152) calls “cineworlding” that makes possible “collaborative projections” (p. 158) with fellow cinematic beings. I can differentiate and realise bifurcations as I embrace incalculables in striving to establish a new pan-species order as part of humanity and the broader infinite community of inquiry. I can mourn the loss of what was, but at the same time take solace in the hope of the irrepressible urge of humanity to rise. And to be clear, this is not a rising that lifts humans up at the cost of all else — although this entropic threat is always present — but rather a rising that lifts all beings up (including our more-than-human kin) through negentropic processes. It is in this way that I declare that I am “learning to live-with climate change” (Verlie, 2019, p. 752) through film, and advocate that such cinematic practices of dreaming ought to be part of Environmental Education in the Anthropocene. To borrow some final words from Verlie (2019), I proclaim that my entanglement with *Gummo* is part of my:

... attuning to the relational composition of the world and thus the self; mourning desirable relationships that are lost as the planet warms; and responding to these conditions in ways that may foster more liveable worlds. (Verlie, 2019, p. 751)

I implore you to find your *Gummo*, to join me in realising more desirable futures through/as film, to embrace cinematic dreaming as integral to enacting Environmental Education in ways that transcend the individual human and embrace humanity in general as part of an Earth-wide quasi-mind. This is part of what I understand Verlie to mean by enacting Environmental Education as learning to live with climate change. To be clear, this Environmental Education as cinema is not about us as practitioners instructing students what to watch, rather it is an epistemological and ontological openness to working with young people (and indeed anyone in the role of a student) in visually and digitally generative ways (Rousell & Cutter-Mackenzie Knowles, 2022; Rousell et al., 2023). As such, we must not only create opportunities for supporting our students to watch what they genuinely want to watch in accepting the end of the world as a potentially new beginning



(Cole, 2023), but also to enable our students to make those films that they want to make in dreaming new futures for humanity and beyond (Littrell et al., 2020; Tayne et al., 2021).

**Acknowledgements.** I wish to thank the Climate Change Education Network and the Film Education Philosophy groups for supporting my passions, as well as Dan Ross for his mentorship in guiding me to engage with Bernard Stiegler's work.

**Financial support.** This research received no specific grant from any funding agency, commercial, or not-for-profit sectors.

**Ethical standards.** Nothing to note.

## References

- Allan, W. (Director) (1985). *The purple rose of Cairo* [Film]. Robert Greenhut.
- Amorim-Maia, A.T., Anguelovski, I., Chu, E., & Connolly, J. (2022). Intersectional climate justice: A conceptual pathway for bridging adaptation planning, transformative action, and social equity. *Urban Climate*, 41, 101053. DOI: [10.1016/j.uclim.2021.101053](https://doi.org/10.1016/j.uclim.2021.101053).
- Bradley, J. (2022). Experiments in negentropic knowledge: Bernard Stiegler and the philosophy of education II. *Educational Philosophy & Theory*, 54(5), 459–464.
- Bradley, J.P.N. (2020). Negen-u-topic becoming: On the reinvention of youth. *Educational Philosophy & Theory*, 52(4), 443–454.
- Clark, L. (Director). (1995). *Kids* [Film]. Cary Woods.
- Cole, D.R. (2023). Rebooting the end of the world: Teaching ecosophy through cinema. *Educational Philosophy and Theory*, 55(10), 1170–1180.
- Colebrook, C. (2002). *Understanding Deleuze*. Allen & Unwin.
- Colebrook, C. (2023). Anthropocene objects: The lifeboat, what is a boat? *Theory & Event*, 26(1), 79–98.
- Deely, J. (2010). *Semiotic animal: A postmodern definition of human being transcending patriarchy and feminism*. Wiley.
- Derakhshan, H. (2015). The web we have to save. *Medium*. <https://medium.com/matter/the-web-we-have-to-save-2eb1fe15a426>
- Erlingsson, B. (Director) (2018). *Woman at war* [Film]. Benedict Erlingsson; Carine Leblanc; Marianne Slot.
- Fay, J. (2018). *Inhospitable world: Cinema in the Anthropocene*. Oxford University Press.
- Ferguson, J.P., & White, P.J. (2024). Science education in the Anthropocene: The aesthetics of climate change education in an epoch of uncertainty. *Frontiers in Education*, 8. DOI: [10.3389/educ.2023.1281746](https://doi.org/10.3389/educ.2023.1281746).
- Fitzpatrick, N. (2020). Questions concerning attention and Stiegler's therapeutics. *Educational Philosophy & Theory*, 52(4), 348–360.
- Forrest, K. (2022). Burning beds and political stasis: Bernard Stiegler and the entropic nature of Australian anti-reflexivity. *Educational Philosophy and Theory*, 54(5), 557–567.
- Gorsky, M. (1896). *Lumiere's cinematograph*. Nizhegorodski Listok.
- Korine, H. (1997). *Werner Herzog talks with Harmony Korine about Gummo* [Interview]. Telluride Film Festival.
- Korine, H. (Director) (1997). *Gummo* [Film]. Scott Macauley; Robin O'Hara; Cary Woods; Nifty da Saurus.
- Letterman, D. (Creator) B., Burnett, R. (Writer), & Foley, J. (Director) (1997). Episode 31 (Season 5) [Television series episode]. In Morton R. & Lassally P. (Executive producer) (Eds.), *Late show with David Letterman*. CBS Productions.
- Littrell, M.K., Tayne, K., Okochi, C., Leckey, E., Gold, A.U., & Lynds, S. (2020). Student perspectives on climate change through place-based filmmaking. *Environmental Education Research*, 26(4), 594–610.
- Macdonald, M.B. (2023). Collaborative projection and the twin ecstasies of DIY cineworlding. *DIY, Alternative Cultures & Society*, 1(2), 151–162.
- Macdonald, S. (2004). Toward an eco-cinema. *Interdisciplinary Studies in Literature and Environment*, 11(2), 107–132.
- Mikulewicz, M., Caretta, M.A., Sultana, F., & Crawford, N.J.W. (2023). Intersectionality & climate justice: A call for synergy in climate change scholarship. *Environmental Politics*, 32(7), 1275–1286.
- Orbison, R., & Melson, J. (1961). *Crying* [Song]. On crying. Acuff-Rose Music.
- Parker, K.A. (1996). Pragmatism and environmental thought. In E. Katz & A. Light (Eds.), *Environmental pragmatism* (pp. 21–37). Routledge.
- Peirce, C.S. (1932/1933/1935/1958). *Collected papers of Charles Sanders Peirce*. In C. Hartsthorne, P. Weiss & A.W. Burks (Eds.). Harvard University Press.
- Petrilli, S. (2017). *The self as a sign, the world, and the other: Living semiotics*. Taylor & Francis.
- Reynolds, A. (1996). Peirce's cosmology and the laws of thermodynamics. *Educational Philosophy & Theory*, 32(3), 403–423.
- Ross, D. (2019). Moving images of the Anthropocene: Rethinking cinema beyond anthropology. *Screening the Past*, 44. <https://www.screeningthepast.com/issue-44-first-release/moving-images-of-the-anthropocene-rethinking-cinema-beyond-anthropology/>
- Ross, D., & Bradley, J. (2024). Interview with Dan Ross. Unpublished manuscript.
- Rousell, D., & Cutter-Mackenzie-Knowles, A. (2022). *Posthuman research playspaces: Climate child imaginaries*. Routledge.

- Rousell, D., Wijesinghe, T., & Cutter-Mackenzie-Knowles, A. (2023). General ecology and speculative pedagogies: Youth digital media practices for climate justice. In R. Beach & B. Smith (Eds.), *Youth created media on the climate crisis: Hear our voices* (pp. 60–80). Routledge.
- Stiegler, B. (1998). *Technics and time, 1: The fault of Epimetheus* (R. Beardsworth & G. Collins, Trans.). Stanford University Press (Original work published 1994).
- Stiegler, B. (2006). *Des pieds et des mains*. Bayard.
- Stiegler, B. (2008). *Technics and time, 2: Disorientation* (S. Barker, Trans.). Stanford University Press (Original work published 1996).
- Stiegler, B. (2010a). *Taking care of youth and the generations* (S. Barker, Trans.). Stanford University Press.
- Stiegler, B. (2010b). *Technics and time, 3: Cinematic time and the question of malaise* (S. Barker, Trans.). Stanford University Press (Original work published 2001).
- Stiegler, B. (2010c). Memory. In W.J.T. Mitchell & M.B.N. Hansen (Eds.), *Critical terms for media studies* (pp. 64–87). The University of Chicago Press.
- Stiegler, B. (2011). Pharmacology of desire: Drive-based capitalism and libidinal dis-economy (D. Ross, Trans.). *New Formations*, 72(72), 150–161.
- Stiegler, B. (2013). The organology of dreams and arche-cinema. *Screening the Past*, 13. <https://www.screeningthepast.com/issue-36-special-feature/the-organology-of-dreams-and-arche-cinema/>
- Stiegler, B. (2018). *The Neganthropocene* (D. Ross, Trans.). Open Humanities Press.
- Tayne, K., Littrell, M.K., Okochi, C., Gold, A.U., & Leckey, E. (2021). Framing action in a youth climate change filmmaking program: Hope, agency, and action across scales. *Environmental Education Research*, 27(5), 706–726.
- Trott, C.D., Lam, S., Roncker, J., Gray, E.S., Courtney, R.H., & Even, T.L. (2023). Justice in climate change education: A systematic review. *Environmental Education Research*, 29(11), 1535–1572.
- Tschakert, P. (2020). More-than-human solidarity and multispecies justice in the climate crisis. *Environmental Politics*, 31(2), 277–296.
- Verlie, B. (2017). Rethinking climate education: Climate as entanglement. *Educational Studies*, 53(6), 560–572.
- Verlie, B. (2019). Bearing worlds: Learning to live-with climate change. *Environmental Education Research*, 25(5), 751–766.
- Watkins, P. (2018). *Dark side of the moon - Global media crisis*. Peter Watkins: Filmmaker/Media Critic. <http://pwatkins.mnsi.net/dsom.htm>.
- Zink, J. (2001). Peirce and the continuum from a philosophical point of view. In P. Schuster, U. Berger & H. Osswald (Eds.), *Reuniting the Antipodes — Constructive and nonstandard views of the continuum* (pp. 303–316). Springer.

## Author Biography

**Joseph Paul Ferguson** is a lecturer in science and environmental/climate education at Deakin University. He teaches and researchers in primary science and technology education as well as environmental/climate education in both the primary and secondary education contexts. Joseph's current research explores pragmatist semiotic approaches to teaching and researching science and environmental/climate education and the use of video methodologies (including film) to undertake design-based research with teachers in schools. He is passionate about the power of theory/philosophy to inform educational practice. Joseph is committed to working with pre-service and in-service teachers to make science and environmental/climate education inclusive and transformative for all young people.

---

**Cite this article:** Ferguson, J.P. (2024). Learning to Live-with Climate Change through Film: The Arche-Cinema of *Gummo* as Climating and Becoming-Climate. *Australian Journal of Environmental Education* 0, 1–18. <https://doi.org/10.1017/ae.2024.56>