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Rethinking Documentary and the Environment: A Multi-Scalar Approach to Time

Therese Davis and Belinda Smaill

ABSTRACT

This essay investigates the analytical potential of time in relation to the nonfiction moving image. Time is important because it drives understandings of environmental change (perceptions of past, present and future), and it is tied to the fundamental expectation of documentary – that it will speak to the reality of historical events (recent or distant). In seeking an approach to the moving image that might better harness the ecological work of documentary across different contexts, we propose a theory of the *multi-scalar* that is explicitly concerned with time and duration and has the capacity to function as a critical tool that might reveal the uneven realisation of scale across cultures and film modes. We explore how established knowledge in political ecology might dovetail with the expression of time in documentary (including the representation of history). We pose two examples. The first explores the natural history documentary, in particular, the time lapse representation of plant life and how it might offer alternative nonhuman temporalities. The second study explores an episode of an Australian television series, *First Footprints* (2013), which presents a history of Indigenous occupation of the continent, ranging across a 50,000 year time span, offering a way to consider colonial conceptualisations of time

KEYWORDS

documentary; ecologies; environment; history; scale; time

AUTHOR BIO

Therese Davis is an Associate Professor in Film and Screen Studies and Director of the Bachelor of Media Communication at Monash University. Her research is primarily in the areas of Australian cinema and television, theories of collaboration and cross-cultural exchange in film, Australian Indigenous film and television, and women's filmmaking. She is co-author with Felicity Collins of *Australian Cinema After Mabo* (CUP, 2004) and author of *The Face on the Screen: Death, Recognition and Spectatorship* (Intellect, 2004).

Belinda Smaill is an Associate Professor in Film and Screen Studies at Monash University. She leads the Environment and Media Research Program in the School for Media, Film and Journalism. Her recent research projects have explored nonfiction moving image culture, animals and the environment. She is the author of *The Documentary: Politics, Emotion, Culture* (Palgrave, 2010), *Regarding Life: Animals and the Documentary Moving Image* (SUNY Press, 2016) and co-author of *Transnational Australian Cinema: Ethics in the Asian Diasporas* (Lexington Books, 2013).

There is a compelling scene in Patrico Guzmán's 2011 essay film, *Nostalgia for the Light*, where the narrator describes how scientists are currently working to produce a powerful radio telescope, an international endeavour centred in Chile's Atacama Desert. The telescope, the viewer is told, "will be able to listen to bodies whose light doesn't reach the earth. It will register the energy produced during the Big Bang." This moment contributes to the broader poetic logic of the film, which circles around, on the one hand, the history of the Pinochet regime and the traces of the bodies of its victims of mass execution buried in the desert and, on the other, the relationship between the history of the cosmos and astronomers' quest to understand its origins. The example of *Nostalgia for the Light* is instructive for our purposes for a number of reasons. It gestures to a paradox of the documentary project – while documentary seeks to bring the truth of the historical world to the screen, this history always exceeds the strategies designed to capture it in textual representation. Guzmán's film is notable, however, in the way it highlights history as a residue, whether it is a residue of light and energy, or the remains of the disappeared. Moreover, it draws the viewer's attention to deep time and a historical expanse that moves beyond both human experience and human existence, situating the human social past of Chile in relation to not only the cosmos, but also to the materiality of the desert's geomorphology, and, thus, the more-than-human environment. Most profoundly, it demonstrates the material interrelatedness of humans and more-than-humans. As one scientist explains, the calcium in human bones "was made shortly after the Big Bang." In his words, "we are part of the universe. The calcium in my bones was there from the beginning."

In this article, we pivot on Guzmán's subtle exploration of the relationship between human and nonhuman histories of the world, recognising them as exemplary of the potential of the documentary to move beyond an anthropocentric scale of earth history that privileges human experience and to show the world as always already temporalised in multiple ways. Understanding this capacity of the documentary is crucial given the urgency, gravity and magnitude of the challenges we face as a species, challenges posed by human-induced global warming and other environmental catastrophes. Central to our approach is the notion of scale. It is often noted how many people struggle to comprehend the unprecedented scale of the processes linking greenhouses gas emissions to climate change, let alone act on that knowledge. We explore how established knowledge in political ecology might dovetail with the expression of time in documentary (including the representation of history) and assert the notion that scale, as a measure of space and time, is implicit in representational practices. In his book-length study of scale and scalar analysis, Andrew Herod writes that "believing the world to be scaled … is likely to shape how we engage with it and so the kind of knowledge about its materiality we produce" (257). Scale is an interpretive tool as well as a modulator of observation. It allows us to move between the molecular and the planetary, micro-seconds and millennia.

Our proposition is this: documentary is a key mode for considering the ecological ramifications of the moving image because, as a powerful time-based sense-making tool, it can enable understanding of multiple and interrelated temporal scales in contexts where different realities and ontologies

might be obscured. An age of environmental crisis offers many such contexts. Proposing an approach to documentary that is multi-scalar, accounting especially for the temporal aspects of scale, we begin by elaborating on the composition of such an approach in relation to documentary, ecomedia and film studies concerns. We pose two examples. The first explores the natural history documentary, in particular, the time lapse representation of plant life and how it might offer alternative nonhuman temporalities. The second study explores an episode of an Australian television series, *First Footprints* (2013), that presents a history of Indigenous occupation of the continent, ranging across a 50,000 year time span and offers a way to consider colonial conceptualisations of time.

A Case for a Multi-Scalar Approach to Documentary

Most frequently referred to as a function of space, whether as size, level or the relation between different measures of spatial formations, scale offers a way of measuring or recognising spatial difference. In film studies, spatial scale is fundamental to understanding the image, with the view of the camera defined by the scale of the human body in the frame (whether a "close up," "mid shot" or "wide angle" and so forth). Referring to environmental documentary, Helen Hughes offers an important discussion of spatial scale when she identifies the relationship between the image, its frame and the human form as a reference point. She draws on the well known chart by film scholars David Bordwell and Kristin Thompson (2004) that describes various shots, from extreme long shot to extreme close up, in relation to how the human body is placed in the shot. Hughes argues for an expanded concept of scale in documentary film, describing how "a shift in the spectrum is created by the growing use of more categories in which the distance between the body and the camera is increased. These categories are: the aerial shot, satellite photography and space photography" (49). The long shot enables greater attention to that which is beyond the human (including landscape), but in the case of space photography humanity disappears and with satellite photography "pattern and broad contrasts become more dominant and humanity begins to appear as a species" (Hughes 50). Through the optic of film studies, spatial scale as scales for observation is a crucial mechanism for considering, for example, the relationship between humanity and the environment and how the frame might reorient our vision of the human body. There is an equally persuasive case to be made for observing the importance of temporal scale (including the crucial interaction between space and time) in understanding the relationship between documentary and the nonhuman.

One of the broad expectations of documentary, at least the canon of expository and observational documentary, is that it is concerned with the social world, as it can be located in history and the sphere of human events, connecting it to questions of time. Indeed, it is the ontological structures of time that make histories conceivable. Documentary indexicality hinges on the relationship with a referent that is recorded by the camera in the past, and then fixed in the recorded image, making it available in the present and the future. The representation of a verifiable past feeds the viewers' expectation of verisimilitude. Contending with the representation of the historical world,

whether recent or distant history, underpins the documentary endeavour. In his landmark book, *Representing Reality*, Bill Nichols grapples with the problem of representing history in documentary. Drawing on Hayden White's distinction between written history and historical existence, Nichols describes the excess that comes with textual formulations of history – historical existence and evidence are always referred to but their wholeness is lost to representation due to the "impasse between discourse and referent, between the signification of things and things signified" (143). For Nichols, "material, historical evidence exceeds all strategies of containment. Even more than fiction …, documentary must bear the burden of historical excess" (149). The key here is not the recognition that the totality of history is lost to representation, but rather *how* strategies of containment make history knowable in textual form. Nichols' approach is underwritten by the assumption that history, and historical time more broadly, is concerned with the social world, as it can be located in history and the sphere of *human* events.

The pressing question of climate change and the Anthropocene requires us to think in terms of geologic history, with the geological concept of "deep time" transforming notions of historical scale to include more than human events. [1] Humans have taken on a new status: that of "geologic agents" (Wilkinson), their activity impacting in profound ways on the past and future of not only earth systems but also geology. The environmental imagination, and the way we make sense of environmental problems, must be understood in relation to time and its conceptualisation. Our approach brings the experience of time – including historical time, and how it cogently shapes our experience of the (natural) world – to documentary studies. Highlighting the centrality of the human in conceptions of history offers a starting point for investigating and elaborating theoretical contingencies that offer a new context to the human and humanities, one that attends to the human, to embodiment, materialism and existence in a way that is not reducible to (human) subject-centred paradigms. This does not entail a rejection of the human subject as a measure for time and space – as Libby Robin writes, the humanities "favours human scale, and focus on what can be seen by the human senses unaided" (4). Instead, we propose a consideration of scale, and a *multi-scalar* approach in particular, in order to *re-orient* the place of the human.

[1] See Dipesh Chakrabarty's description of "Anthropocene time" (2018).

Studies in ecomedia and related fields have already accounted for spatio-temporal considerations. One particularly rich area for consideration has formed around the notion of "slowness." For example, in a formal respect, the long take of the camera succeeds in creating an extended duration, and combined with fewer (or no) cuts between shots the pacing is slowed. These "slow aesthetics" (Lam) bear a relationship to "slow cinema" [2] and create a cinema experience that requires a more focused contemplation of the image and scholars such as Stephanie Lam, Tiago de Luca and Belinda Smaill have discussed this issue, specifically in relation to the production of a new awareness of the nonhuman. Rob Nixon's influential theorisation of "slow violence" has also informed approaches to the moving image, particularly documentary film. His notion of the "temporalities of place" informs Alexa Weik von Mossner's discussion of *There Once Was an Island: Te Henua e Nnoho*, a film that addresses the plight of the people of Takuu, an island near Papua New Guinea that is slowly disappearing due to sea level rise. Salma Monani

[2] See Gorfinkel for an insightful elaboration of slow cinema.

also takes up the notion of slow violence in her analysis of *In God's Land*, a documentary that explores the context and meaning of the land around a small rural village, Inam Alungalam in Tamil Nadu, which has been sold to developers and designated for massive economic exploitation. Both analyses explore how Nixon's concept of a "violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space" (Nixon 2) to understand the ways filmmakers grapple with the expression of, as well as the process and impact of ecological violence. More broadly accounting for the ways in which film might provide an experience that shifts our perceptions of the environment, Scott MacDonald's work has lead the way in advocating for and exploring how the "job of an ecocinema is to provide *new kinds of film experience* that demonstrates an alternative to conventional media-spectatorship and helping to nurture a more environmentally progressive mindset" (20). Such film experiences necessarily engage our understanding of the space and time of the nonhuman natural world.

These accounts illuminate the way that physical space (or place) and ecological temporalities are crucial considerations when understanding how ecocritical approaches might interrogate the work of the moving image. We build on this important work with the aim of outlining the contours of a more ambitious endeavour. Moving beyond a focus on the poetics of avant garde cinema or individual documentary films concerned with environmental issues, we propose a malleable approach that addresses the diverse examples that occupy the fertile ground at the intersection of documentary and environment. These include celebrated "auteur documentaries" such as *Nostalgia for the Light*, but also the broader range of more quotidian documentary media such as television series and nature documentary. The purpose of such an approach is not necessarily to map the ideals of an "ecocinema" but to open a space for the critical evaluation of a range of nonfiction media forms. In seeking an approach to the moving image that might better harness the ecological work of documentary across different contexts, we propose a theory of the multi-scalar that is explicitly concerned with time and duration and has the capacity to function as a critical tool that might reveal the uneven realisation of scale across cultures and film modes.

A number of scholars in the environmental humanities have addressed the question of scale [3], including Salma Monani and Joni Adamson who theorise the importance of Indigenous cosmopolitics. Specifically, Monani and Adamson describe the recent revision of ecocritical perspective through the lens of cosmopolitics, a revision that "implies that we are entering a moment in politics that takes as its goal … the recognition of intergenerational, evolutionary space and time required not just for the survival of all species, but for the recognition of the 'rights' to life for all humans and nonhumans" (24). Such a notion recognises the world (human and nonhuman) as constituted through a planetary network that operates across multiple scales, temporal and spatial. As Monani and Adamson note, Indigenous cosmovisions often offer ways of rethinking the intersection of ecological practices and how to conceive of the expanses of history. They frequently "articulate dynamic epistemologies that have been negotiated over long histories (sometimes thousands of years), and many present sound ethical and scientific reasoning for ecological protection" (24). We acknowledge the importance of cosmovisions as an

[3] See also Joanna Zylinska's *Minimal Ethics for the Anthropocene* (2014).

analytical tool and return to it below in our discussion of *First Footprints*. However, we are also mindful of the ways in which it is deeply bound up with Indigenous worldviews that are tied to conceptions of place, history and identity that are specific to particular cultures and sites.

Pursuing a notion of scale as a trans-ideological and trans-cultural tool, in our definition of the multi-scalar we propose a distinct interdisciplinary approach, one that explores the productive intersection between political ecology studies and conceptualisations of the documentary moving image. A key concept in ecology and human geography, scale is frequently understood as *relational* – it is not an absolute or discrete measurement of size or duration but rather it offers a way to understand the relations among phenomena (Sayre, "Climate Change" 105). Moreover, it is produced by observation and the scale of observation determines the configurations and phenomena that appear. Central to core debates in ecology, the move away from classical ecology has come with a recognition of how "natural systems are determined by multiple processes operating simultaneously on numerous spatial scales" (Sayre, "Ecological" 279). Like spatial scale, temporal scale is dependent upon observation: "the same ecological dynamics may be considered transient or in a steady state depending upon the scale of observation" (Wu and Loucks 446). Multi-scalar analysis and questions of observation are not therefore "just a methodological imperative but also a political one in environmental studies" (Sze) for they can expose not only the extent of deeply powerful forms of human impact on the environment but how this occurs *unevenly* across territories, periods of time and cultural contexts. It is not simply a matter of displaying how things get bigger or smaller in size or longer or shorter in duration. Rather, scale must be seen as ecological. This allows for a perception of phenomena beyond anthropocentric perspectives, enabling us to grasp how ecological systems are determined by multiple processes operating simultaneously in numerous spatial dimensions and to recognise that temporal dynamics of natural systems are best understood as changing states of stability with various forms of resistance, resilience and thresholds of change between alternative states over time.

Cinema is a temporal experience – as we have noted, the image refers to a past event, captured by the camera. In the case of documentary, the time and space of this past event are especially key to the construction of narrative events. Often that which is recorded by the camera, which might include interviews, archival materials and reconstructions, refers to the event captured on screen, as well as events from an even more distant past that are referred to by interviewees or reconstructed in sound and image. Moreover, the experience of cinema is an experience of duration. As Malin Wahlberg notes in her account of documentary time and phenomenology, duration is tied to the viewing experience and it "cannot be measured beyond our qualitative judgement of time passing" (88). Henri Bergson, a philosopher primarily concerned with the metaphysics of time and a pivotal influence in the work of André Bazin and Gilles Delueze, offers a productive avenue to consider time as duration in a multi-scalar sense. Understanding temporal scale as duration allows for identification of particular states such as the "slow violence" mentioned above – it allows for a recognition that multiple durations exist simultaneously. Bergson holds that duration must always be regarded as a

continuity in the present instant. The "present necessarily occupies a duration" (137) that is a singular whole. Elizabeth Grosz's description of Bergson's conception of duration encapsulates this possibility:

> Duration is both singular and a multiplicity. Each duration, each movement, each act forms a continuity, a single indivisible whole; and yet, there are many simultaneous durations, as many perhaps as there are actions, which implies that all durations participate in or can be linked through a generalized cosmological duration, which allows them to be described as simultaneous. (183)

A simultaneous cosmological duration becomes, in political ecology, a question of how some durations are normalised and others marginalised or made invisible.

Understanding the politics of duration also requires an examination of how observational tools, such as documentary, produce or make duration visible. In the interests of working through the potential of what we propose more precisely, the following sections analyse two examples that demonstrate the problem of scale in very different ways. These studies are not intended to comprehensively elaborate or exhaust the notion of the multi-scalar as an avenue of enquiry. Instead, they offer two possible contingencies and, thus, establish a provocation for further work. At the heart of these investigations is the notion that observation can occur through different scales, and thus different durational modes. Within this is the potential not simply to perceive events through longer or shorter durations, but also to reconceive the phenomena observed.

Documentary and Vegetal Life

Returning to the example of *Nostalgia for the Light*, Guzmán's film offers a model for the notion of multiple durations which are, in effect, scales. Nilo Couret describes how the film "plays with issues of scale at its thematic and formal registers, toggling between the human, the geologic, and the cosmic in order to tease out the corporeal implications of scale and its relation to the past" (69). Couret understands scale as a way of comprehending the past. He writes: "The image becomes the site not for unearthing and making the past copresent but instead for orienting and making the past intelligible through the projection of our body's spatial and temporal coordinates onto the image" (69). In this case, the body is projected in order for it to function as a defining measure. There is, we suggest, a further contingency in play here, one that asks how documentary might trouble the perceived centrality of human corporeality, also reorienting notions of time as they revolve around human perception of duration. As we have argued at the outset of this article, *Nostalgia for the Light* references cosmological duration, dwarfing the duration of human existence. From this vantage, the human is the point of recognition for the viewer only in as much as it is recast, becoming a small part of a much larger spatio-temporal scale for observation. Moving away from the planetary writ large, and *Nostalgia for the Light*, this section explores another interesting documentary example, one posed by the temporal aesthetics of the nature

documentary, and the representation of plants in the natural history documentary in particular.

To offer some context to this example, it is important to note that in traditions of nature documentary, it is not plants but rather animals that are the true stars. In the American wildlife film tradition outlined by Cynthia Chris in her book *Watching Wildlife*, animals are the focal point, and this has been the case since early precursors in the safari film of the silent period. The British tradition offers a different example, one more associated with natural history filmmaking. The BBC's Natural History Unit has been the key producer of natural history programming in the UK and has evolved through the influence of amateur naturalists and a commitment to science as entertainment and education. Over the last two decades the most high-profile productions of the BBC have exceeded other BBC international productions in terms of budget, technical innovation, the time taken in production and the breadth of shooting locations. *Planet Earth* (2006), *Planet Earth II* (2016), *Blue Planet* (2001), *Blue Planet II* (2017) and *Frozen Planet* (2011) constitute a cycle of television series that share a global thematic focus and unparalleled commitment to advancing the technological capacities of the televisual moving image. Their "scale" in terms of planetary themes, commercial reach and investment is unsurpassed. Most discussion of these "blockbuster" documentaries produced by the BBC has focused on their representation of animal life and, to a lesser extent, their function as travel narratives. Indeed, animals are the central concern of these series, which take up the life cycles of different animals (including hunting, migration, mating, etc.) to drive the drama, with events and their visual representation tailored, as Helen Wheatly describes, to the capacities of home entertainment systems for high resolution spectacle.

This cycle is noteworthy for our purposes because these series shape their narratives through technologies of vision that increasingly re-orient viewers' expectations of space and time. Aerial and satellite photography has transformed the visuality of space (Druick). The aesthetic and narrative manipulation of time has always been key to understanding nature documentary. Animal life cycles are compressed with the action on screen the result of a camera crew waiting for hours or days for a particular shot. The tempo of documentary events, in this respect, quickens the rhythms of nature. Moreover, the non-mimetic pacing of time is a key part of the visual lexicon of high-end nature documentary as technological innovations allow a different pacing of the image to reveal what otherwise might be hidden from sight. This pacing is non-mimetic in the sense that it does not replicate human experience of vision and time; it employs an altered scale of observation. Time lapse photography and slow motion serve to expand and condense time, with durational differences offering a new optical frame for considering the nonhuman, one that makes incremental fluctuations of the nonhuman visible. In one respect, this multiplication of duration speaks to the viewer in ways that emphasise the heightened technical virtuosity of the nature documentary, especially the Planet cycle. This evokes a certain mastery over the image that signifies to the viewer an associated mastery over nature, which is subordinated to increasingly refined technologies of vision. This is, however, only one reading of duration and the nature documentary. We explore a further contingency, one that moves away from an anthropocentric focus on technical

virtuosity to ask what this technology might reveal about the temporal dynamics of natural systems.

While many examples of nature documentary, particularly the blue-chip mode, anchor the dramatic narrative in the animal world, there are important examples that also explore plant or vegetal life. We turn to the BBC production, the ten-part series *Life* (2009), to investigate the generative possibilities that exist at the intersection of time scales, documentary and the nonhuman. While not produced through transnational funding arrangements of the kind that facilitated the high budgets of the blockbuster Planet cycle, *Life* was an expensive series costing an unconfirmed £10 million. The ninth episode in the series is titled "Plants" and focuses almost exclusively on vegetal life. This episode and other examples that focus on plant biology, such as the BBC series *The Private Life of Plants* (1995) can be located in a particular tradition of British science film that includes the micro cinematic experiments of Charles Urban and Francis Martin Duncan, but has a particular association with Frank Percy Smith, [4] a pioneer in working to capture the movement of plants through time lapse photography in the early 20th century.

[4] See Oliver Gaycken's *Devices of Curiosity: Early Cinema and Popular Science* (2015) for a detailed discussion of this early cinema.

The temporal manipulations of nature documentary have the potential to alter our understanding of the dynamism of plants and institute a new understanding of nonhuman temporality. They trouble the experience of direct observation that tells us that vegetal life is static. One sequence that has been much discussed in media commentary about the episode demonstrates this in compelling ways – a single shot that shows a six-month season of activity in an English oak woodland and unfolds over only one minute. This uninterrupted take is a tracking shot that begins with a frame focused on a mossy log in a Devon wood. As the camera tracks backwards the frame takes in more of the scene and moves under a tree branch to gradually show a more animated vista that encompasses flowering daffodils, foxgloves, cyclamen, ferns and other plants. The flower stems sway and the blooms unfold as the camera then pans across the scene, taking in tendrils of bramble that move towards the light as shadows alter slightly with the shifting position of the sun. The movement of the camera serves to accentuate the motion in the frame. Michael Marder's pivotal work on vegetal life offers a way to consider the relationship between human time and the temporality of plants:

> the spatio-temporal movement of plants, nonsynchronous with human time, is directed toward and by the other (light, the changing seasons, etc.) and therefore, unfolding as a hetero-temporality, is governed by the time of the other. Seasonal variation, for its part, imposes cyclical and iterable existence on perennial plants and spells out the finitude of the annual ones. (12)

For Marder, vegetal time has no direct relationship to "human time" – its durational scale is determined by features of the environment such as light and heat and the temporality of changing seasons are tightly bound up with vegetal existence and transformation. Plant temporality is dissociated from human time, but has an "indissoluble connection of the plant to the time of the [nonhuman] other" (12). While it is nonsynchronous with human time and impossible to perceive through unmediated observation, this shot makes

visible not only one plant but multiple plants transforming at different rates. The woodland scene asks the viewer to recognise the vegetal durational processes that cannot be reduced to human duration but exist alongside it. With this, it seeks a recognition and re-evaluation of the dynamism of plants that exist around us in everyday environments and their activity in the ecology as shown by their movement and change relative to other plants. This is especially relevant in a Western epistemological tradition in which activity is valued over perceived passivity.

Notably this scene is discussed in promotional material circulating around the series because the ten minute "making of" sequence at the end of the episode, titled "Life on Location" revealed the extent of the human labour that was involved in producing the one minute shot. The process took two years and while the original tracking shot was captured on location, the scene was recreated in a studio and each species of plant recorded against a blue screen as it grew. As the viewer is shown, ninety-six layers of footage were digitally superimposed to create the final scene. The changing conditions outdoors meant that such a long period of time-lapse photography could not be sustained. While the whole scene was graphically composed, the "Life on Location" sequence points out that all of the plant species were filmed in ways that captured their actual temporal development. Nevertheless, the other – the conditions of sun, rain and heat – were artificially constructed in the studio. While in one respect the recreated studio scene demonstrates human technical abilities to capture and thus master the otherwise hidden vegetal world, in another respect, it points to the exertion required to attain such mastery. Nature, from this vantage, is not easily subordinated to the will of the camera, but rather it requires labour and persistence to recreate that which occurs ubiquitously in the nonhuman world. Time-lapse photography, especially a shot that encompasses so many components of a natural system, requires long periods of camera activity to account for the otherwise hidden dynamism of plants.

As we have noted, the scale of observation allows processes and phenomena to appear, potentially offering a way to understand the relations among phenomena. In this example, six months is perceived through a one minute scale. If *Nostalgia for the Light* evokes planetary time and the cosmos, or massive durational scale, the single shot of the woodland brings awareness to seasonal duration over six months in a few square metres of space. The shot reveals how plants move and respond as they extend towards the sun, activity that occurs for each plant in ways that are stabilised and energised according to the biological cycles of those organisms. The durational cycle of each life form exists simultaneously. To make this perceptible, the shot employs time-lapse photography which, in contradistinction to the slow aesthetics noted above, accelerates the unfolding moment.

Documentary and the Cosmopolitics of Geological Timing: *First Footprints*

In this section, we shift our focus away from the seasonal temporalities of plant life to the vast scale of geological epochs, also known as "deep time." As Cinzia

Cervato has noted, although "geologic" and "deep" time are often used interchangeably they refer to different aspects of time:

> Deep time, the coinage of Thomas Carlyle (1832) and later popularized by the writer John McPhee (1981), emphasizes the dizzying stretch of the past beyond human culture (i.e., older than 8000 years ago). In contrast, geologic time highlights the way geoscientists tell time – a coarse time scale in which millions of years are the most common coins of currency. (3)

In recent years, however, historians' interest in so-called prehistorical human culture has been challenged through groundbreaking archeological findings that have unearthed material evidence of the rich culture of Indigenous peoples who have inhabited Australia for more than 50,000 years (recently revised to 65,000). This has led to a new interdisciplinary practice of "deep history" that requires historians to collaborate with scientists. We are interested in the cosmopolitics of the management of the scalar dimensions of this new interdisciplinary approach to time and culture and how it is apparent in a documentary series that aims to tell the deep history of Indigenous occupation of Australia. *First Footprints* (2013) was written, directed and produced by Australian-based filmmakers Martin Butler and Bentley Dean for the Australian Broadcasting Commission (ABC-TV). Unlike *Nostalgia for the Light*'s multi-scalar perspective, this popular science series is singularly preoccupied with dating Indigenous occupation of the Australia continent. [5] Yet, as Leroy Little Bear argues, "no matter how dominant a worldview is, there are always other ways of interpreting the world" (77). Using multi-scalar as an analytical tool, we draw attention to important scenes where Indigenous storytelling of planetary events breaks free from the constraints of the dominant geological time frame, allowing the viewer a glimpse into experience of simultaneous durations, which as Grosz theorises (noted earlier), participate in "a generalized cosmological duration" (183).

Described as "a televisual archaeological 'dig'" (The Walkley Foundation), *First Footprints* adopts and adapts geological and archeological practices through a range of documentary techniques. Its four-part structure carves Indigenous pre-invasion history into four distinct periods that correspond to geo-temporal durations of extreme planetary changes: Super Nomads (50,000 to 30,000 years ago); The Great Drought (30,000 to 15,000 years ago); The Great Flood (18,000 to 5,000 years ago); and The Biggest Estate (9,000 years ago to 1788). The series includes a "voice of god" narration, voiced by Ernie Dingo, an Indigenous television celebrity, lending its story a certain authenticity through his Indigenous voice (sonically and symbolically). Yet the story is largely chronicled by leading non-Indigenous Australian archaeologists whose discoveries have attracted international attention by contributing new data to scientific spatio-temporal debates about "the timing and rate of dispersal of modern humans out of Africa and across south Asia" (Clarkson et al. 306). In keeping with the televisual science documentary trend of scientists as hosts and collaborators, the archaeologists are filmed at various archaeological sites of significance across the Australian continent where they perform expositions of their findings in staged conversations with Indigenous traditional owners. Events from deep history referenced in these encounters are supported

[5] Which term to use when referring to the original inhabitants of Australia has been a fraught political question. This article follows the recommendation of the Australian government's *Style Manual* to use *Aboriginal* (with a capital "A") as a noun to replace *Aborigine*. *Indigenous* is the preferred inclusive adjective to encompass both Aboriginal and Torres Strait Islander peoples. We use a capital "I" for *Indigenous* when referring to Indigenous Australian peoples and cultures and lowercase "i" when referring generically to indigenous peoples around the world.

visually by actuality shots of spectacular rock paintings and other visible evidence of Indigenous culture such as fish traps. A sense of deep time is also evoked by graphically rich non-synchronous visualisations, including animated megafauna created by Animal Logic (the visual effects team behind the hugely popular *Walking with Dinosaurs* series), sweeping aerial shots of Australia's vast deserts, and animated scenes of volcanic eruptions, melting glaciers and other large scale events in the earth's changing surfaces.

At the same time, the series representation of deep time relies upon various methods of manipulating the viewer's judgement of duration of the vast temporal intervals of geological time. Animated shape-shifting 2D maps are employed to visualise the extremely slow pace of deep time, that is, to make the almost imperceptible shifts in movement of the templates of the earth's surfaces over tens of thousands of years visible. These include the slow rises in sea levels that separated the Australian continent from what we now know as Papua New Guinea and which are otherwise invisible to the human eye. Vast amounts of time are thus reduced to a small amount of screen time. As we argued earlier, in these instances duration determines the scale. The world shrinks from a global scale to a national frame that centres the Australian continent while these maps in turn visually collapse time into short intervals to make duration observable and comprehensible geologically. So not only is the dizzying effect of deep time managed and reduced in these segments, they contribute to the containment of Indigenous scalar dimensions of experience of time.

As Ann McGrath suggests, the modernist obsession with timing and chronological dating can be jarring because "many Indigenous Australians hold a sense of the past as an immediate part of living contemporary landscape" (3). Following Isabelle Stengers' concept of cosmopolitics, we argue that this problematic difference cannot be resolved by abandoning or rejecting "the science." Rather it a question of analysing how the series' adoption of an archaeological empirical method of dating might enable or constrain possibilities for multiplicities, co-existences and accommodations of differences.

Episode three, "The Great Flood," for example, represents a time scale of approximately 15,000 years, a period following the ice age where the planet started heating up causing the sea level to rise over 130 metres the viewer is presented with two accounts of the geological events that led to the formation of the majestic sea cliffs of the Nullarbor Plain in southern Australia. The episode begins with a montage of discontinuous images of stormy skies, swirling oceans and sweeping aerial views of the 50–90-metre-high sea cliffs. We then cut to an ethnographic soft-focus, black and white photograph of an Indigenous tribal group, edited so as the naked figures appear to be looking uneasily beyond the surging waves to a horizon of rising sea levels. Documentary still and moving images like this of unnamed people photographed sometime in the early-20th century period post British invasion are used extensively throughout the series to stand in for ancient ancestors. More than an obvious visual cheat, the intent of this technique seems to be to illustrate the continuity of Indigenous occupation. Yet as a manipulation of time(s) it constrains the viewer's perception of the historical time colonial

invasion captured in and through the image's indexical relationship to the subjects and landscape of the time of its making, rendering Indigenous Australians as an unchanging culture from a deep time not linked to recent history. Not only, then, is the episteme of the ethnographic mode alive and well in this series, its use as a device for representing human life in deep time paradoxically undermines the story of dynamic change the series seeks to tell.

As the scene unfolds, it moves into contemporaneous time and stages a cross-cultural exchange on a Nullarbor cliff top between Australian archaeologist, Scott Cane (author of the book that accompanies the series, *First Footprints: The Epic Story of the First Australians*), and a group of five Pitjantjara men, only two of whom are named, including Fred Grant. The men are seated cross-legged in a circle, and it is Grant who shares the Wati Nyiinyii Dreaming story of coastal inundation – "the great flood" that created the Nullarbor cliffs, a story which we learn has been passed down to him through hundreds of generations. Speaking in a Pitjantjara dialect, translated on screen in English subtitles, Grant begins:

> They [Wati Nyiinyii ancestors] were living in the desert then. People travelled down here and saw the water coming in. It could have come a long way inland. If the water kept coming there would be no people left. My father, grandfather, mother, would never have been born. We would not be here if the water continued rising. People asked, what are we going to do? How can we stop it?

The narrator, Ernie Dingo, then picks up the story, albeit in a more literary "mythical" mode, illustrated now by more images of the swirling seas and flocks of desert finch:

> In the dreaming story the desert finch, or ancestral beings, travelled from the centre of the continent to confront the great flood. The Wati Nyiinyii, bounded their spears together and dived into the water to form the cliffs of the Nullarbor. All the Wati Nyiinyii drowned but the ocean was stopped.

Cutting back to Grant, he continues his story *in situ*, reinforcing a continuity between then and the specific location of the here: "In the ancient times, the ancestral beings made these cliffs we're sitting on." This statement is followed by a cut to a wide shot in which Cane speaks for the first time. Pointing outward to the ocean behind him, he adopts an oddly repetitive mode to explain his scientific version of this geological event to the elders:

> As an archaeologist, we know that the sea was way out beyond the horizon, right. And then slowly, slowly, slowly came in, in, in. And on the science, we know that it started to come in 18,000 years ago out there, and came up and up and then stopped at 6 to 7,000 years ago, which means, if the two stories are about the same thing, it [your story] is the oldest religious story in the world, right. What do you think about that?

Grant replies, "We understand very well," to which Cane, employing a mix of English and Pitjantjara, reinforces his thesis that scientific dating enabled through collaborations of geoscientist and archeologists corroborates Indigenous knowledge and validates its culture – the first religious story. In his words: "Facts and Dreaming. The same. Myth that's History. Myth that's History." Interestingly Grant replies to Cane's assertion that facts and dreaming are "the same" by simply restating his relationship to the story: "My father, nanna, grandfather taught us the story of this flood. They said: listen to the law."

The use of term law is crucial. On the one hand Grant recognises the modernist universalising timescale that Cane introduces to prove the objective reality of the geological change of his story. In doing so, he accommodates it within his worldview/law: "We understand very well." Cane on the other hand claims that Myth and History are the same yet does not, or, perhaps more correctly given the ontological constraints of this uni-versal Western worldview, cannot accommodate the Dreaming story on its terms. Rather it is figured as an alternative representation of the "same thing." This is not to suggest that Grant capitulates to the notion that his story is the same as "the science." Rather his performance of his story in the now time of the series' cross-cultural exchange as law, as passed down to him, demonstrates that Indigenous storytelling is more than an alternative mythical representation of past events – a religious story of origin. It, too, is History. That is a contemporary act of Indigenous storytelling as a mode of being in the world sustained in and through transmission of extant memory across millenia. [6] As Grant says, "People travelled down here and saw the water coming in."

[6] For an influential account of Indigenous story as history, see Rumsey (1994). For a more specific account of stories of sea level rise as memory, see Nunn and Reid (2015).

We have paid attention to *First Footprints* not simply to expose its flaw of reproducing the colonising discourses it seeks to counter through an imposition of the uni-scalar framework of chronological dating. Nor are we suggesting that Australian Indigenous storytelling is a utopian alternative universalising frame for knowing the origins of the earth. Rather our multi-scalar analysis has sought to reorient understandings of the series' intercultural exchanges in a way that makes the few small performances of Indigenous story it allows audible. The Wati Nyiinyii story of transformational beings – ancestral spirit beings that become finches that become spears that become cliffs—is a small yet great example of the work Donna Haraway calls "making kin": entanglements of the human and more-than-human (160). [7] As Joni Adamson and Juan Carlos Galeano argue in "Why Bears, Yakumama (Mother of All Water Beings), and Other Transformational Beings Are (Still) Good to Think," many indigenous stories from around the world of transformational beings serve as a powerful lesson in futurity by reminding us that human survival at any time relies upon a mutual and interdependent relationship with the more-than-human (228).

[7] For more information on how "cultural theorists, anthropologists, multispecies ethnographers, ecocritics, and others are revealing why 'persons' who move in the cosmic realm are associated with a hope for the future, which is being termed 'cosmovisions, thousands of years in the making'," see Adamson and Monani ("Introduction" 2017).

First Footprints conveys science and scientists (in the form of geology, archaeology and their manifestation in graphical visual modelling) as the singular authoritative source of evidence for measuring temporal scale and assessing the magnitude of deep history. The series does so through the gestures and address of the expository documentary, gaining influence from the mode's argumentative power to conceal perspectival understanding in

conventions that promote the appearance of absolute and settled knowledge. As we have shown, the series reinforces conceptions that align history with Enlightenment notions of progress and science while constraining Indigenous expression of historical experience and denying them a place in the scalar and durational complexity of time. *First Footprints*' final episode ends with an Indigenous voicing of a well-known slogan from the Aboriginal Lands Rights movement of the 1970s: "Always was and always will be Aboriginal land." This poignant ending ironically renders Indigenous occupation of Australia as an indeterminate duration while signifying the everywhere of multi-scalar cosmovision in which all durations and the beings that inhabit them are simultaneously realised.

Conclusion

The physical world, like history, becomes available to us in cinema through the way it is constituted through strategies of representation. Keeping in mind Nichols' critique of the documentary project and our attention to how strategies of containment make history knowable in textual form, our studies show that the exploration on screen of time passing is a situated and ideological endeavour. If the concepts of slow violence and slow cinema demand a rethinking of duration and regimes of vision and cultural norms, they reveal how media trains us to place our attention on some processes and spectacles and not others. We build on this temporal politics to suggest that a more comprehensive approach to time and the nonhuman has much to offer.

In our example of vegetal life and the time-lapse of nature documentary, changing the scale of observation enables the viewer to perceive the duration of a season across seconds. This scale alters the perceptual temporal relationship and allows plants to appear differently, as active and mobile. In the case of *First Footprints*, the documentary privileges colonial time as it is registered in geological time and archaeological evidence across an expanse of millennia. Yet alternative scales of observation also exist, cosmological ones that perceive the complex interactions between entities (human and nonhuman) space and time. *First Footprints*, at times, gestures to this alternative or more multi-scalar approach yet does not choose to fully accommodate it. A consideration of scale offers the potential to view the entanglements of human and nonhuman worlds in ways that critique how, as viewers, we are able to access different phenomena and how we understand them to relate to one another. O'Neill and King write that "If you move far enough across scale, the dominant processes change. It is not just that things get bigger or smaller [longer or shorter in duration], but the phenomena themselves change" (4). Changing the scale changes whether or not and how particular phenomena even appear. The relationality of time is key to understanding the nonhuman environment. Rather than a single scale, world-making necessitates multiple simultaneous scales.

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