

## Documentaries without documents?

*Ecocinema and the toxic*

Karl Schoonover

NECSUS 2 (2):483–507

DOI: 10.5117/NECSUS2013.2.SCHO

### Abstract

A recent wave of ecological documentaries made in the United States and Europe appear to confer with this sense that waste is something to which we are blind. These documentaries forecast an impending environmental catastrophe of trash, a future global disaster with its roots in humanity's current unwillingness to acknowledge waste as a problem.

**Keywords:** cinema, documentary, ecocinema, toxic, waste

In his *Theory of Film*, Siegfried Kracauer tasks the medium of cinema with a particularly modernist realism, one that recovers the significance of things cast aside and overlooked views. For him, the medium fulfills its potential when it produces images that defamiliarise the familiar or expose what is hidden right in front of our eyes. The most cinematic films make us look at things that we otherwise avoid acknowledging. Utilising the camera's ability to see more of the world than we allow ourselves to see, the film image redeems our relationship to physical reality. One of the exemplary 'blind spots' revealed by the camera is garbage. Under the heading 'The Refuse', he writes:

[m]any objects remain unnoticed simply because it never occurs to us to look their way. Most people turn their backs on garbage cans, the dirt underfoot, the waste they leave behind. Films have no such inhibitions; on the contrary, what we ordinarily prefer to ignore proves attractive to them precisely because of this common neglect.<sup>1</sup>

Here, in a book arguing for the political potential of cinema as a medium, we find the film camera's representational potency epitomised in its unique capacities to reveal the waste-laden world. Already apparent in Kracauer's brief commentary on refuse is the acknowledgement that modernity's waste culture not only leads to an omnipresence of debris but also fosters a mode of vision that enables its denial. The word 'refuse' names stuff we do not want to see anymore; it is what we refuse. Slavoj Žižek also tells us that dominant modes of vision are structured by the absencing of garbage. In fact, he goes so far as to argue that at the core of our ideological engagement in the world is the optical removal of waste. Standing in a large industrial dump speaking for a documentary on contemporary philosophy, he says, 'part of our daily perception of reality is that [garbage] disappears from our world'.<sup>2</sup>

A recent wave of ecological documentaries made in the United States and Europe appear to confer with this sense that waste is something to which we are blind. These documentaries forecast an impending environmental catastrophe of trash, a future global disaster with its roots in humanity's current unwillingness to acknowledge waste as a problem. This group includes feature-length 'eco docs' such as *The 11th Hour* (Leila Conners and Nadia Conners, 2007), *Crude* (Joe Berlinger, 2009), *Flow: For Love of Water* (Irena Salina, 2008), *GasLand* (Josh Fox, 2010), *The Cove* (Louie Psihoyos, 2009), *Trashed* (Candida Brady, 2012), and *Waste Land* (Walker, Harley, and Jardim, 2010). Many of these films initially aim for a theatrical release and follow on the box office success of Davis Guggenheim's film of Al Gore's lecture *An Inconvenient Truth* (2006).<sup>3</sup> Most are widely available on DVD and shown on pay television. Other films are smaller, community-supported productions that find audiences at festivals and online activist platforms, such as a series of Italian films about the garbage crisis in the south: *La bambina deve prendere aria* (Barbara Rossi Prudente, 2009), *Biùtiful cauntri* (Esmerelda Calabria and Andrea D'Ambrosio, 2008), and *Una montagna di balle* (Nicola Agrisano, 2009). What unites this diverse group of films is how they view cinema as an instrument to confront its audiences with the physical facts of the world. Following a Kracauerian mission in which revelation is political, they see themselves reigniting vigilant modes of visual discernment in order to raise environmental awareness. At the same time, they are unconsciously exposing a mounting problem that is harder to see.

If waste is by definition the material that we do not want to see and abject from our vision, then what about forms of waste which are not visible? What about hazardous materials that photography fails to register or are imperceptible to human vision? In what follows, I consider how the formal

means by which these films return garbage to our gaze often fails to capture the toxic.<sup>4</sup> Through an analysis of representations of toxic waste, I hope to expose a distinction elided in the contemporary eco docs: the distinction between rubbish that we refuse to be shown and a toxic reality that cannot be seen. Does the realist imperative to photographically reveal the world do more to obscure than to document humanity's most menacing waste?

## What is there to reveal

About 45 minutes into *Waste Land* there is a traveling long take that is fairly typical of how certain eco docs politicise garbage.<sup>5</sup> It begins with a medium long shot of a woman bending over with a large orange bucket and picking through a pile of garbage. The camera slowly pulls back, revealing a larger and larger field of detritus. After a few more seconds we realise that what we took to be a crane shot is most likely a camera on a helicopter. The shot shocks us with the scale it reveals: the human figure is gradually swallowed up by the trash heap. The design of the shot, which gradually increases its distance from the ground, uses the ever-vaster landscape of garbage to interrupt a blindness in the viewer. Slowly the proportions of the problem expand, forcing us to ask: is our world filled more with trash than with anything else? The image addresses itself to a viewer who has yet to realise the scope of rubbish's encroachment on life. Another garbage documentary, *Trashed*, also uses crane and helicopter shots to alternate between global and personal scales and to visually reinforce its tag line, which could equally serve as the motto of *Waste Land*: 'if you think waste is someone else's problem...think again'.<sup>6</sup>





*Fig. 1: Telescoping of scale leaves the human figure dwarfed by a mountain of garbage in Waste Land.*

These two films – and many of the others mentioned above – tell us that our participation in a destructive human ecology is enabled by our denial of rubbish. They work to disabuse us of the naïve belief that we can throw anything away, that everything is disposable, and that our homes and communities should strive to be completely free of waste. This belief depends not only on our routine isolation of detritus, but also on the excision of garbage from our sight and from our visual culture. These documentaries



advocate for political awareness by demonstrating how the film image can be used to challenge conventional protocols of vision, ingrained cultures of seeing, and hygienic (thus both ideological and unsustainable) optical regimes. The problem of waste is then a problem of visual representation that these documentaries propose to resolve by uncovering our eyes with revelations that only the cinematic image can supply.

No sooner have the images in *Trashed* shown us the problem than its narrator, Jeremy Irons, divulges that the trash heap's real threat lies in an imperceptible danger: a festering toxicity as hard to track down as to contain. The problem of waste today is not only what we are conditioned not to notice in our field of vision, but also what is simply impossible for human perception and photographic images to register. New forms of waste challenge our sense of where trash turns up, and thus can be seen pushing on the limits of conventional methods of documentary exposition. No longer confined to bins, sent off to dumps, or whisked down drains, the most virulent forms of waste are everywhere, both inside and outside of us. This omnipresence of waste challenges popular conceptions of the integrity of boundaries separating the human from her world. The similar shots from *Waste Land* and *Trashed* described above use the kind of bold and expensive camera work more common in fiction films to attempt to address the new parameters of waste by inducing an unsettling telescoping of subjective scales.

*Waste Land* remains more hesitant in its articulation of the toxic. The transvaluative practices shown in the film (making art from garbage and artists from pickers) evade the toxicity of the modern garbage dump raised by the film's voice-over. The dangerous permeating and destabilising materiality of the toxic are largely unacknowledged. Indeed, the artworks that result from Muniz's collaborations use the camera to quarantine the toxic. These photographic portraits would have us believe that in pictures garbage can still be garbage; it can exist without all the toxins unleashed in modernity's trash heap. The film's collaborative artworks and the documentary's image track more generally remain fairly blind to the question of toxicity's reordering of the materiality – a reordering that the spaces of the world's largest dumps exemplify – while inoculating the vision of garbage from toxicity's dangers.

Equally problematic, *Trashed* implies that new forms of waste are extensions of old forms of garbage. There is a slippage in this film between conventional forms of rubbish (Lebanon's spectacularly mountainous garbage heaps) and new forms of waste (invisible dioxins). Recognition of this conflation should urge us to distinguish ideological blindness (not seeing

the garbage that is in front of and all around us) from the imperceptibility of certain phenomena (not seeing microscopic mutations or long-term transformations that typify the invisible contamination associated with toxicity). This is not to deny the workings of ideology at play in the notion of the imperceptibility of the toxic. In fact, we might say that the toxic is double-blinded to us, because we both do not want to see it and it is fairly impossible to see except in its aftermath. The visibility of toxicity is tricky because it permeates our world in ways that are hard to be shown in the image. Those ideologies that conspire to conceal the toxic are in this sense particularly nefarious, because they adhere to those conditioned ways of seeing that already hide waste from view. *Trashed* and its slippage from garbage to toxin inadvertently aids and abets this conspiracy to conceal new forms of waste.

Toxic accumulation is not the same phenomenon as rubbish heaping. Although the films often use the latter as a metonym for the former, each should be understood as originating from incommensurate epistemologies of waste. To conflate toxins and rubbish is to confuse distinct environmental hazards in a manner that threatens to muddle any effective response. To shirk the dilemmas that toxicity poses to visual representation is to conceal the contradictions at the heart of popular environmental media today. In a time when refuse is no longer only that which we refuse to see, do longstanding conceptions of cinema's documentary capacity permit – even require – these ecofilms to confuse these two modes of waste? Do these contemporary documentaries purport to raise the issue of something whose true nature they cannot represent? Are they documentaries without documents?

## Old and new imaginaries of waste management

The discursive problems of *Trashed* and *Waste Land* expose how contemporary culture's cognizance of the toxic is limited by how it continues to cling to an early rubbish mentality. In other words, the documentaries often keep both modes of waste at play – an anachronism that leads to contradictions and inconsistencies. This complicated dualism marks the historicity of these films and of the popular culture of environmentalism. Before continuing our interrogation of how these films approximate the toxic, it is crucial to sketch a general trajectory of waste.

An old-fashioned and in some sense pre-modern notion of waste remains prominent in our vision of the world, despite being out of synch with our

world's major environmental crises. The modern world has provided technologies that make waste elimination quicker and more effective. In the global north, there is a certain postmodern hyper-vigilance about either banishing waste or erecting a sensory barrier between it and us. This is evidenced by the transatlantic prominence of brands like Febreze, toilets that quickly refill to accommodate the double flush, scented trash bin liners, and the proliferation of hand-sanitizer dispensers in public buildings. However, alongside this acceleration of the elimination approach to garbage, many of us have accepted our coexistence with waste. Waste remains part of our daily lives. An increasing number of wealthy municipalities in industrialised nations have shifted garbage collection to only twice a month, and this means that garbage stays longer in most people's domestic settings, even if hidden under a countertop (or in electric composters that decompose meat for days without producing odors). It is no longer front page news when medical waste washes up on the vacation beaches in Fire Island, New York, and we have almost come to expect horrifying reports like those revealing an entire island in the Maldives as a lagoon of toxic waste. Along with eco docs, many television exposés tell us that manmade toxins live in all our bodies and often remain there most of our lives.<sup>7</sup> The regular media attention given to the facts of our new world suggest not only persistent public concern for the environment, but also a growing unconscious reconciliation with the toxic's proximity, an acquiescence in the ordinariness of dangerous contaminants. Toxic waste leads a strange double life in contemporary industrialised nations: it is reviled and yet common, both invisible and intimate.

Both attitudes toward waste are fantastical and unviable: the persistence of an anachronistic understanding of waste (human life depends on its waste being fully-disposable) makes as little sense as reconciling ourselves to a contaminated future (human life will persist in a poisoned environment). Toxins cannot be put aside so easily. Since toxins do not readily degrade, they could be seen as refusing to ever fully leave our world. Increasingly, it is not just bulk trash that builds up in piles, but toxins that crowd us on the planet, invading our private spaces, our public lives, and our world's geopolitical realities. Toxins remind us of their staying power in a nagging 9/11 cough or in elevated levels of mercury in fish. They linger in bodies, mutating in generations of cells. It is possible that human existence will never surpass the persistence of toxicity's force. In this sense, the toxic challenges standard definitions of materiality and object-ness.

Political theorist Jane Bennett begins her book *Vibrant Matter: A Political Ecology of Things* by using the modern materiality of garbage as a means

of animating her larger call for a new materialist philosophy: '[o]ur trash is not "away" in landfills but generating lively streams of chemicals and volatile winds of methane as we speak.' The new approach to materialism that she proposes aims

to articulate [the] vibrant materiality that runs alongside and inside humans to see how analyses of political events might change if we gave the force of things more due. How, for example, would patterns of consumption change if we faced not litter, rubbish, trash, or 'the recycling' but an accumulative pile of lively and potentially dangerous matter?<sup>8</sup>

Bennett does not use the word 'toxic' here, but it is clear that her sense of trash is one infused by a modern notion of toxicity and its challenge to traditional conceptions of materiality.

In the late 1990s, literary theorist Lawrence Buell wrote that contemporary liberal political culture is plagued by an 'awakened toxic awareness',<sup>9</sup> one whose logic has largely evaded any critical unpacking. He argued that 'the fear of the poisoned world is being increasingly pressed ... . Seldom however is toxicity discussed as a discourse.'<sup>10</sup> In other words, we know the world is toxic, and yet rarely have cultural theorists spoken to how meaning is made from the toxic or how the toxic is deployed rhetorically. What Buell terms 'toxic discourse' denotes a mode of ecological concern whose logic we have yet to interrogate.

## Cinematic discourses of the toxic

What then are the specifics of the 'toxic discourse' present in recent eco docs? In narrating specific ecological realities, do they acknowledge how the toxic profoundly challenges everyday notions of materiality? Or do they play into our phantasmatic nightmares, where plastic bottles lead directly to cancer, all lipstick is laden with lead, and nature is forever lost? As I have suggested above, it seems clear first that they invest in spectacles of rubbish in a fetishistic manner that allows us to affirm the horrific new forms of 20th- and 21st- century waste while simultaneously denying them. This is not to say that modern eco docs shy away from the topic of toxins in the environment. They aggressively pursue visible evidence of the toxic's origin and its aftermath. However, in narratological terms we might say that these films' narrational style follows an odd mode of explication by depicting causes and effects but never revealing the agent or showing the



moment of change. Unable to show us toxicity in action, they instead must trace its path or measure its repercussions.

Surprisingly, modern eco films often admit that the toxic operates at scales and paces inaccessible to photographic registration. In this sense, they are not unlike health education films of the 1950s, straining to demonstrate the path of contagion by using animation, or science fiction films of the same period showing the monstrous transformations of nuclear contamination.<sup>11</sup> One key reason to watch the eco docs of the last decade is in fact to observe their struggle to establish a cinematic language in which the toxic can become visible, make its effects known, and, to a degree, have its new materiality acknowledged. This struggle also marks their historical specificity as texts.

Take, for example, the Academy Award-winning documentary *The Cove*, which centers on a 'mission impossible' of capturing images (and the sounds) of a massive secret dolphin slaughter that regularly takes place in a highly-guarded cove on the coast of Japan. Billed as documentary's answer to the heist film, *The Cove* details the risky and daredevil efforts of the filmmakers to get the kind of footage that will change public perception of dolphin killing and will end the slaughter by bringing it to the forefront of public awareness. The film's dramatic suspense rests upon a realist film politic: images can transform public perceptions of reality. However, *The Cove* pauses in its suspenseful build-up to the revelation of gut-wrenching footage of a huge dolphin massacre in order to explain why sea mammals are vulnerable to extreme mercury poisoning. In doing so the film gradually abandons the indexical photographic images for a few minutes during a sequence describing mercury accumulation and its biomagnification as it travels up the marine food chain to large mammals such as whales and dolphins. No longer are we shown sensational views of suffering dolphins. Instead, we see a series of several statically-framed shots of factories with smoking stacks and power stations spewing steam – iconic metonyms of industrial pollution and an impending future of contamination. Sentences of written text proliferate the screen with facts. Then, in one shot the camera abruptly zooms in on the exhaust gases from a power substation in a photographic image, as the voice-over narration declares that mercury poisoning begins at the molecular level. The exhaust fills the frame and blurs the image. Small particles begin popping into focus across this gray field. The particles are digital animations of droplets ripe with mercury. From these virtual figures other illustrations emerge, such as drawings of fish and sea mammals. As these pictures come to dominate the frame, they arrange themselves into quantitative graphs to illustrate how 'mercury starts in

the environment with the smallest of organisms'. Crucially, the film does not conceal its move away from photographically-generated pictures and towards non-indexical forms of image-making. The transition is overt and pointed: the nature of the toxic demands a temporary shift in the means of depiction.

This sequence is only a small part of *The Cove*, but nevertheless modern waste clearly presents a challenge to photographic depiction and threatens to disrupt its realist project. Many other eco docs use maps, charts, graphs, and other animations to illustrate the increasing presence and proximity of toxins that are dangerous to human life. These cartographic and symbolic images allow a film's argument to traverse vast expanses of space and time, exceeding what is observable by one human or even within the timeframe of a typical film's production schedule.

When it comes to toxins, the drawn or computer-generated illustrations are particularly useful to the average eco doc, because they can demonstrate the processes of microscopic and even subatomic change, where the most alarming threats of manmade materials happen. These non-indexical images are also able to isolate a subject matter so that those transformations with the greatest environmental impact can appear as patterns, even when spanning decades and continents. By contrast, the photograph's indiscriminate collection of 'data' is often far too inclusive for these purposes. However, there are a few exceptional photographic images that act like charts and graphs, expanding the parameters of ordinary human vision: comparative satellite imagery of the melting ice caps, or instances from a film's camera crew returning to the same location several months or years later to reveal increased contamination.

## The limits of the visual

Given the attention granted the toxic, its resistance to photographic means of documentation, and its destabilisation of realist practices of representation, it is surprising to find the photographic image maintaining its virility across much of eco criticism. Many ecocinema theorists seem suspicious of the documentary film image for its seductive pictorial plentitude, suggesting it is rhetorically manipulative (read, propagandistic). Others note the image's apparently inherent reifying tendencies, regarding the cinematic frame as a violent fixing and bracketing of the natural world.<sup>12</sup>

There are crucial exceptions. In fact, a few scholars are willing to acknowledge how photographs and films are often confounded when repre-

senting modernity. Julie Doyle writes that 'global warming prompted a crisis of representation and thus communication for environmental groups'.<sup>13</sup> She contends that while climate change's catastrophic future is 'unseeable', advocacy around climate change has continued to use photographic means to represent a crisis with vast spatial and temporal parameters. In the end, she suggests that utilising photographs restablises the world, change, and the future in a nefarious manner. In a related fashion, Sean Cubitt argues that since the evidence for climate change is largely statistical, global warming presents a representational problem for eco advocacy films:

numbers are not intrinsically photogenic. We need to see these invisible tendencies formed visibly for us.<sup>14</sup>

Cubitt's study implies that the modern eco documentary is defined by its dependence upon graphic prosthetics and photographic depiction.

Data visualization, embracing cartography, numbers, graphics, and simulations, is integral to the discourse of climate change: its use in *An Inconvenient Truth* is emblematic. Global events like climate change do not occur in humanly perceptible scales or time-frames ... . Godfrey Reggio, for example, pioneered the use of time-lapse photography in his trilogy *Koyaanisqatsi*, *Powaqqatsi*, and *Nagoyqatsi* ... .<sup>15</sup>

Anita Angelone writes of how toxicity is articulated in documentaries responding to Italy's 'garbage emergency'.<sup>16</sup> In this rich and careful analysis, Angelone describes how pollution destabilises the image. A series of subjective disturbances descend on the viewer of one documentary when that film's camera reveals a site of toxic contamination. Across these uniquely sensitive essays, there emerges the suggestion that modern ecological visual culture grasps for a means of representing the environmental crises of today and tomorrow. Each of these studies tells us that photographic documentation cannot proceed normally and instead must seek compensatory means of representation.

## Compensatory figures

As a medium, cinema has rich figurative potential. It can produce metaphors not only within its images but also across a collection of different shots through editing. In fact, film language has evolved as a central

means of compensating for what the photographic cannot depict. Eco docs compensate for not being able to represent the toxic itself by leaning upon cinema's ability to mix images: the capacity to depict different temporalities simultaneously (speeding up traffic to demonstrate accumulation of air pollution over a single day in *The 11<sup>th</sup> Hour*); to draw illustrative comparisons by bringing otherwise incommensurate spaces together (water-rights protestors in Bolivia alongside refugees dislocated by China's mammoth dam projects in *Flow*); to transition quickly across scales (from the microscopic to the global in *The Cove*); to exploit different registers simultaneously (documentary, fictional, explanatory, narrative, abstract, sensual in *La bambina deve prendere aria*); and to speak in different voices (testimony, advocacy, emotive, etc. in *Una montagna di balle*). Eco docs use these compensatory modes to suggest rather than depict how the toxic affects the environment as well as how it disrupts conventional conceptions of the physical world.

These films often rely on drawing comparisons between the condition of the earth and the human body, such as the suggestion that the ecosystem is similar to our digestive track. These metaphors and analogies work to familiarise the otherwise complex, obscure, or obscured realities of the environment's failing health. In doing so, the films often reify the things they seek to depict, making nature into something fixed and reaffirming commonsense notions of the world that reflect more about human culture than ecology. In other words, anxiety about the toxic's inarticulable and undepictable materiality triggers these films to fall back on certain engrained ideological notions of both the human and nature when explicating matters figuratively. Consider, for example, how films attempt to compensate for toxicity's unsettling of representation by invoking restrictively hetero-normative notions of sex, gender, and reproduction. Like all good figurations, these symbols, metonyms, and analogues can be read against the grain.

Many of the experts in *The 11<sup>th</sup> Hour* come close to saying that the solution to ecological disaster is the end of humanity. Nature would be much better off without us on the planet. And yet the film's intermittent montage sequences draw analogies between the human body and the planet's health that undermine the force of expert commentaries. One of the film's longest montages draws equivalences between impending doom and tornadoes; it also establishes large monstrous machines as the cause of dead animals. Meanwhile, the film emphasises the vulnerability of human reproduction across this montage with a constant return to images of a fetus in progressive stages of development; fetuses also appear prominently in *Trashed* and *Flow*. The fetus in *The 11<sup>th</sup> Hour* is meant to remind us of the ultimate stake

of the impending apocalypse; it represents the frailty of human life on the planet. The fetus signifies our most precious resource. Photographs of fetuses do not stand as neutral icons of hope in any contemporary political visual vernacular. Such images cannot be seen without reference to the incendiary iconography of late 20<sup>th</sup> century battles over reproductive rights and women's health. So this image's instability threatens to undermine the taken-for-granted status of human reproduction. Each time the film returns to the fetus and it has grown a bit more, the soundtrack reflects this growth with a louder heartbeat. This pulsating sound encourages an alternate perspective on the fetus. From this view, the fetus is less an emblem of nature's beautiful design and more a parasite replicating itself and taking over the world. The intensity of this growing fetus represents the precariousness of life on earth in two contradictory ways: it is both victim of pollution and pollutant.

*Flow* makes similarly unstable recourse to human reproduction. At one point, the film shows a Berkeley scientist explaining how the widespread use of pharmaceuticals leads to the dumping of endocrine disruptors into the rivers and streams. These substances threaten the biological integrity of animals by altering their reproductive systems. Most vulnerable to disruption are frogs living in this polluted water, many of whom lose their sexual function. As the scientist describes how one toxin 'demasculised', 'chemically castrated', and 'even feminised' male frogs, *Flow* cuts to a clip from a black and white cartoon of a frog applying lipstick and powder. By using this image to illustrate the problem of contamination, the film implies that frogs have gender and sex roles akin to those of humans. The frog cartoon thus showcases a problem with anthropomorphising metaphors: they naturalise social norms as givens of human life while imposing cultural expectations on animal life. Why should a cross-dressing male of any species worry us? The figure of the frog with his maquillage conflates three threats: the artificial permeating the organic, the human world invading the animal world, the feminine encroaching on the masculine. An interesting reverse-anthropomorphism takes a conservative turn in this otherwise liberal rhetoric: the upending of the human sex-gender system signals a major environmental disruption and makes urgent the precarious future of an animal species.





*Fig. 2: In Flow, toxins trouble gender norms.*

To be clear, few of us want our hormones altered without our consent. Population control has a terrible history in eugenics and totalitarianism. I offer my alternate readings of these sequences not to endorse involuntary hormone disruption (though many of us voluntarily manipulate our hormones to untether our sexual and gender identities from their apparent biological 'destiny'), nor do I wish to minimise the threat to life on earth that these disruptions pose. However, I wish to question the presumption made by these films that the earth's health and human reproduction are mutually-affirming phenomena. Furthermore, in defending the sovereignty of our own bodies and those of other species, the films subtly encourage us to regard reproduction as the ultimate expression of our humanity. These films far too casually reify gender/sex systems as the natural path of life. Through the back door of these attempts to depict toxicity comes a whole set of values which have very little to do with the environment: the parity of gender, the need for all humans to reproduce, and the suggestion that reproduction defines part of what constitutes human being.<sup>17</sup> A larger population on the planet is not necessarily a bad thing, and crowds of humans need not be menacing. But from a purely ecological perspective, fewer humans on the planet would help the environment. Why encourage more human reproduction when, as this film reminds us, the planet's population has tripled since 1960? Why are we not working to foster the legitimacy of more non-reproductive lives? Why not champion the value of non-procreating people rather than pathologising them as barren or undesirably queer?

If these images of a frog applying lipstick and the juxtaposition of a fetus with oil spills attempt to establish the monstrosity of the toxic by making it seem unnatural, they also rely upon the shock value of seeing things combined that we never think of seeing together. These images are then also examples of how these films explore the toxic through two key vectors: the astounding ubiquity of dangerous waste and its devastating proximity. Think of the highly rhetorical function of images of children in these documentaries: a child plays in dumping grounds in *Crude*; hunts for Easter eggs on a lawn dotted with lesions left behind by fracking in *GasLand*; drinks from polluted streams in *Trashed*; or, tries to breathe through pollution in *La bambina deve prendere aria*. Toxic contamination exposes fundamental inadequacies in our conventional conceptions of proximity, ownership, responsibility, and community. In the repetition of the endangered child, the toxic's virulence – its destabilisation of the physical integrity of spaces and bodies – leans on the traditional emblem of human reproduction and hope for the future.

### The toxic subject in motion

Eco documentaries also address proximity through their camerawork, point of view, and perspectival frame composition. They frequently use shots of huge trash mounds that crowd the frame around that figure (*La bambina deve prendere aria*) or dwarf the human subject (*Trashed*). Dramatic camera movement and aerial photography further underscore toxicity's pervasiveness as an accumulation that threatens the human subject. The nearly incomprehensible and almost sublime scale of the problem of toxic contamination is articulated in the increasing elevation of these shots.<sup>18</sup> The crane-cum-helicopter shot from *Waste Land* with which we began further minimises the human subject by contrasting its immobility to the mobility of the camera. Using dramatic shifts in scale and perspective made possible by cinema, the composition of this image traces the disappearance of human subjectivity as it is consumed by the menacing reality of garbage. The image of a figure disappearing into an inanimate morass of junk anticipates a future in which the trash heap will overshadow our sovereignty. At the same time, the craning of the shot seems able to release us as viewers from the oppressive wasteland of unrelenting clutter. This emblematic shot of dystopia comes to its own rescue through a point of view that is spectacularly able to rise above the scene.

The camera's movement allows for a virtual transcendence of our earthly circumscription; it opens up a new frontier where the viewer can escape the confines of this troubled world and shrug off difficult geopolitical questions of sustainability and environmental management that define our current situation. In her work on television spectacle, Helen Wheatley interrogates the aerial perspectives of 'vertiginous zooms' and helicopter shooting that characterise contemporary high budget nature documentaries. This spectacularisation of the landscape leads to modes of contemplation that, Wheatley suggests, have an ambivalent if not contradictory relationship to land conservation. She writes that, despite the outward 'environmental conscience of these programmes, ... the economy of the "view" is always an underlying issue in this programming which both expresses discomfort at the commercialization of the British landscape whilst cashing in on this very thing.' She continues, stating that '[w]hilst ... a "spectacular view" on television is designed to appeal in a number of ways to a contemplative viewer watching beautiful images in spectacular clarity, the question of what else this contemplation might distract us from is one that requires further thought and debate.'<sup>9</sup> Her analysis of the aerial view is particularly useful for how it suggests that revelation and clarity may lead to obfuscation. The spectacular views enabled by the camera betray the contradictory environmental politics proposed by these programs. In other words, by making a spectacle of 'clarity', the films engage a mode of contemplation that threatens to distract audiences from the pressing matters of land management and conservation.

*The 11<sup>th</sup> Hour*, *Flow*, and *Crude* all use aerial photography of nature's verdant majesty as a counterpoint to their more apocalyptic visions. By flying us over and above idyllic scenery, they allow us short vacations from the grimness of the polluted world. These moments of respite supply a subjective escape route for the viewer from the confines of a polluted present and from the catastrophic destiny it foretells. They lend viewers a virtual subjectivity that is able to move between different strata of pollution, different levels of toxicity. These shots thus renege on representing the toxic by containing it in a manner antithetical to its nature. Since the toxic names an invisible but subtending proximity of poison, a menacing accumulation, or a concentrated contamination (or load), these modulations of volume and scale serve as a kind of virtual inoculation of the contemporary subject that protects him/her from the claustrophobia of toxicity's omnipresence. These traveling shots allow us to experience the earth's surface as a green and lush world seemingly unmarked by human intervention. Like another common example of the typical eco doc's shots – the big blue marble view

of the earth from outer space – it offers a similarly suspect restoration of the planet's pre-human existence. Whether sweeping us across thick jungles of the Amazon basin or marveling at our planet from a distance, the camera boldly declares its power to make the earth into a landscape – a gesture replete with humanity's presumptive dominance of nature.<sup>20</sup> The clarity of wide-open skies and the agility of the sweeping aerial camera also restores the binary logic that these eco docs' earlier attention to the toxic threatens to dismantle; our return to nature via a perspectival puissance suggests to us the restoration of binaries the toxic has forever erased – the natural versus the artificial, safe versus poisonous, pure versus impure. Ultimately, the aerial view seems to veil the instabilities introduced by the toxic by proposing cinematic spectatorship as a viable escape from the ubiquity of pollution.

### A festering bareness

As much as the compensatory lexicon of metaphors and camera movements reflects the persistence of an anthropocentric worldview, the toxic's destabilising force works to disarm many of these films' more conservative impulses. In this final section, I explore the possibility that the inadequacies exposed in the film image by the toxic are still richly cinematic despite their apparent visual paucity.

The moments that come closest to documenting toxic substances – as opposed to the more pedestrian processions of rubbish pileup – possess an unsettling and uncanny materiality that seems to deprive the filmic of its basic feature as a moving picture: movement. Toxins appear present in disturbingly still matter, and they are often contrasted to natural and organic substances depicted as vibrantly in motion. For example, the stagnating piles of uncollected garbage that crowd many of the early shots in *La bambina deve prendere aria* form a wasteland within the shot composition that is counterpoised by a plane of movement. In one lateral tracking shot, a mother pushes a baby carriage along the street while behind her a mammoth mound of rubbish looms in all its stillness. In another shot from the same film, garbage occupies most of the foreground of the shot, while a zone of movement and life peeks out from the background in the form of a fairground with brightly lit amusement rides. The fair's festivities are blocked by the garbage heap but not entirely obscured by it, creating a tension between static dead zone and vibrant movement. In *Flow*, the life-producing and life-affirming qualities of water are made known in

shots that ask us simply to observe water's movement. Nature moves with a vigorous but gentle grace, as if always peaceful and life affirming in its effervescence. When the camera reaches areas of toxic contamination, such as polluted ponds and oil spills, they often appear to be stagnant or sluggish.

Toxins occupy overcrowded and colorless locations, clogged backwaters. They lurk somewhere in the cloudy glass jars of contaminated drinking water in *GasLand* that refuse transparency even when held up to the light. *Flow* locates toxins by using one of modern environmentalism's most recurrent images: a bird being pulled from crude oil, wings immobilised by the tar's strong pull on the animal's body, as if the oil's stickiness is a set of hands pulling the bird deeper into the black morass. The oil has obliterated the bird's coloring, erasing its particularity and effacing its distinctness from its surroundings. In *Trashed*, Jeremy Irons spends several minutes pondering large specimen jars containing the bodies of stillborn babies deformed from dioxin poisoning. This is a terrifying spectacle whose grotesquery is made all the more morbid by the immobility and uniformity of the figures in the jars. The liquid that surrounds them carries a brown tint that flattens the contours of their bodies and any nuances of skin tone and hair color, washing out their features. In all three cases – the swampy polluted backwater, the helpless bird, and the infant bodies in jars – an impoverishment of the pictorial accompanies the scene's stillness. The toxic dulls the image, deprives it of movement, and even blots out its figurative capacity altogether.

When the toxic does move, its motion must be pathologised: it creeps, seeps, overflows, and seethes. Toxic movement is too stealthy and too slow for the cinema. Measured in terms of alternating generations and half-lives, if its effects are to be seen, the toxic must be artificially sped up. The unnatural rhythms of modernity, such as the pulsating traffic flows in *The 11<sup>th</sup> Hour* and *GasLand*, produce clouds of pollution and waves of radiating heat, both of which have an obscuring effect on the image. Here again a tension emerges between the toxic and the pictorial density of the film image, calling into question the capacities of the medium itself. The technology of cinema seems less able to lay bare the toxic than to un-blind us to debris.<sup>21</sup> Perhaps this explains why a certain abstraction overtakes the pictorial frame when these films turn their lenses to contaminated sites such as the floating sewage in *Flow* or the pits of sludge in *Biùtiful cauntri* and *GasLand*. These images fail to depict much and refuse to serve as evidence of anything other than an abyss of negation.<sup>22</sup>

When *Crude* excerpts an activist video animating the problem of petroleum-based chemicals, a black crude oil seeps from the top of the



frame and obliterates the image completely. The voice-over here suggests that the Chevron corporation conspires to 'keep us in the dark' about the real costs of petroleum drilling in the Amazon, but the image suggests that it is the toxicity of the substances themselves that draws a curtain on representation.<sup>23</sup> This overspill of petroleum is not unlike the misty gases that rise off the trash heap in *Trashed*, the aerial photography of Agent Orange blotting out the forests hovering below the camera in file footage shown later in the same film, or the clouds of smog in *The 11<sup>th</sup> Hour* and other documentaries representing air pollution.

At moments, these films admit that they are attempting to describe something that cannot be shown. When the investigatory television documentary *Who Killed the Honey Bee?* introduces pesticides as a possible cause for colony collapse, images of crop-dusting planes rush towards us, spraying a cloud of grey mist that leaves the image nearly empty. The loss of the image's pictorial definition, color, and movement allow the programme to define chemicals as noxious poisons whose effects are hard to contain. Not only is toxicity hard to film, it threatens the cinematic. In each case, toxins crowd out the pictorial content, making the image less and less able to represent. Many of these shots end with a blank image, completely grey or black.

Here it might seem logical to turn to a recent batch of arthouse documentaries whose outwardly aesthetic projects suggest the film image as a site of investigation and that promise an expanded visual vocabulary unhinged from conventional modes of depiction. Their attention to form encourages audiences to explore sublime dimensions of the industrial landscapes, engaging the philosophical alongside the factual. *Manufactured Landscapes* (Jennifer Baichwal, 2006) and *Our Daily Bread* (Nikolaus Geyrhalter, 2005) aim to reorient viewers through experimentation with scale and duration that seeks to shift our perspective on the relationship between large-scale factory production and everyday life. *Tankograd* (Boris B. Bertram, 2009) proposes that a city poisoned by nuclear waste dumping might propagate rather than smother creativity in a way that subtly questions the terms of reproduction. *Dust / Staub* (Hartmut Bitomsky, 2007) argues that cinema is a medium made in and through dust. As interesting as these films are, we do not need to turn to them to discover what is radical about the toxic's cinematicity. In the more standard and even ordinary documentaries that I have been discussing, the image's limited ability to depict the toxic with any clarity should not be understood as a failure. These inadequate depictions may be barren or even sensorially fallow, but they are never uncinematic. The lack of pictorial density or blurriness says something

about the limits of the medium, to be sure, but it also speaks to the limits of our sense of ecology. The straining visuals of these more conventional eco docs are symptoms of two epistemologies of waste – garbage and toxic matter – colliding.

Alongside the instances when the toxic is depicted as a problem for the image, there are also moments when its menacing unseen materiality takes on a spectral presence in these films. In *Trashed*, the camera fixates on a ghostly substance: odd webs of foam that have erupted from soil where a farmer dumped his cows' contaminated milk months earlier. We are left to assume that the webs of foam are a result of the dioxin poisoning found in the cow's milk, but the film never tells us what the foam is or whether it is toxic. The substance remains important, however, because it evidences the toxic; it does so precisely in its palpably indeterminate materiality, its near supernatural insubstantiality. Later in the same film the camera focuses on the blue ash of a trash incinerator, whose color seems both otherworldly and clearly generated by an industrial process. This ash is as oddly unnatural as would be a bright blue vegetable. The ambiguity of its physicality foreshadows the discussion of an even more dangerous ash. The earlier blue ash ends up standing in for this latter more dangerous and invisible 'toxic dust', which we are told is replete with nanoparticles of heavy metals and dioxins.



Fig. 3: Ghostly webs of white foam represent the toxicity of dioxin for the documentary *Trashed*.

From one perspective, the politics of these films might be regarded as inadvertently reactionary since they help to transform the corrosive force of the toxic back into a now old-fashioned and anachronistic materiality of waste as rubbish – one in which toxins can be contained, fixed in place, and flushed away. So no matter how much the eco docs outwardly proclaim the moving image as a means of reversing obfuscation, their images of toxicity operate in the opposite manner according: they mystify and obscure information in the image.

However, the ghostly qualities of the sinister mist, diaphanous froth, and vibrant dust bespeak a representational crisis, one that is not so easily contained by this critique. The apparitional visuality of this material might be seen from a different critical perspective. From this perspective, the spectrality of these images documents toxicity's endless contamination and its corrosive nature, which renders impossible any total – or clean – disposal. In the distortions to the clarity of the material depicted in the still framings of waste, I would argue, we find these films demonstrating precisely the ways that the toxic refuses the integrity we ordinarily grant objects and beings in our physical environment. These moments tell us something about how the toxic jams, confuses, and confounds the spaces and times that order our world. The contents of these images violate the parameters that demarcate objectness and hence the pictorial means by which we ordinarily assign materiality to things. In these moments of image failure, these films appear most honest in their depiction of toxicity and its consequences. They succeed in representing the toxic's complexity when they ask: *is the conventional documentary image equipped to represent our toxic world?*

## Conclusion

I began this essay with Kracauer's comments on refuse in the film image, suggesting that they prompt us to think more broadly about cinema as a medium inextricably connected to human notions of waste. Traditional theories of the photographically-generated image, including Kracauer's, tell us that the film camera's automatic collection of visual data always exceeds what the director or cinematographer wants included in a shot.<sup>24</sup> The photographic film image invariably contains excess (background details, gestures, etc.) that appear in spite of anyone's intention. If the film's camera is inherently 'a rag-picker',<sup>25</sup> as Kracauer puts it, then cinema is the structure that systematises these rags or 'sights of refuse' by organising them

for us into views, visions, spectacles, vistas. As the formal structure that makes stories and arguments out of raw footage, cinema is in this sense a waste management system. When we say an image is 'cinematic', we are recognising not only that that particular image includes things the camera automatically registers, but also that the film text utilises happenstance and balances accidental features of the image against intended compositional effects, such as stylising lens flare. We are also recognising how that image's excessive details lose their significance when that image is combined with other images into a narrative sequence or montage whose threads distract us from the less important bits. Recalling Phil Rosen's notion that documentary is constituted in the moment of embedding a document within a formal (discursive) system, we can say: the film image is to cinema as document is to documentary.

Kracauer declares his interest in how the excesses of the image can be used by directors to underscore a film's larger themes. He also carefully avoids saying that the refuse that ends up in the image is *always* narrativised, that it is always made relevant to the intended purpose of the image. Here and throughout *Theory of Film*, Kracauer remains aware that cinema never fully systematises the film image. It follows that the documentary film text can never fully confine or contain the resonances of its documents. Refuse always retains some of its own potency.

Contemporary eco-docs are never fully in control of the 'sights of refuse' that they show us. Toxicity and its resistance to representation only amplify the threats to stabilised meaning posed by the document. In many instances, the toxic image reveals just how conceptually ill-equipped these documentaries are for describing the post-industrial realities of our physical world. These documentaries also admit, willingly or not, that they cannot delimit the toxic through the image. Is it then the case that the toxic establishes itself cinematically in spite of what is intended? Or does the toxic continue to evade filmic representation?

Kracauer believes that film images are at their truest when they retain and convey the materiality of the world. Cinema 'manifests itself in letting nature in and penetrating it'; it 'acquaints us with the physical origins' of the world.<sup>26</sup> He imagines cinema as not simply an investigation but also a reengagement with the material world and nature. On the one hand, he says that cinema 'seems to come into its own when it clings to the surface of things', but he also states that cinema 'leads us through the thicket of material life'.<sup>27</sup> Eco docs never fully apprehend the materiality of modern forms of waste in a way that would provide useful scientific knowledge about toxins. The white webs of foam, the chalky blue ash, the blank preda-

tory fog, the non-reflective ponds: these are not toxins per se. The camera lingers on these substances because either toxins were present here or will emerge. In pausing before these sites, the films cannot help but admit their ambivalences about whether cinema can fully depict reality. The toxic challenges cinema's capacity to render the material world as visual text, and in doing so asks whether cinema is still the medium to redeem the physical world in our eyes. Nevertheless, in these attempts to visually account for the presence of new forms of waste, a relational or subjective instability comes to the fore that attests to the radical disturbances of toxic contamination in our world. Even where the toxic resists precise depiction, its vestiges continue to haunt the image, registering something of the transformation of materiality that the toxic entails. Whether that lessens or increases cinema's ability to lead 'us through the thicket of material life' is yet to be known.

## Acknowledgments

I am grateful for the essential guidance and critique I received from Lucy Fox, Matilde Nardelli, Harriet Palfreyman, Alexandra Schneider, and Wanda Strauven. Sarah Hodges and Jean Walton were incredibly generous in their engagements with my argument, as were the journal's anonymous readers.

## Notes

1. Kracauer 1997 (orig. in 1960), p. 54.
2. *Examined Life* (Astra Taylor, 2008). Žižek's commentary can be found in this clip from the film <http://www.youtube.com/watch?v=iGCfiv1xt0U>.
3. I intend the discussions of the films mentioned here to be exemplars of a mode of representing waste. By no means do I mean to suggest this as a comprehensive list, and this essay might easily be expanded to include many films that Sean Cubitt would describe as 'populist environmentalism'.
4. When standard English dictionaries identify modern uses of the word 'toxic', they usually invoke humanity's most infamous disruptions of the planet's surface environment: manmade poisons, debt, polluting fumes, radiation, and insecticides. This is opposed to 'toxin', which is often defined as a substance originating from an animal or plant. More than 'toxin', then, the word 'toxic' carries an association of dumping and of hazardous materials that are on the move. The toxic leaches, leaks, and seeps.
5. *Waste Land* claims that artworks change lives, and not only ordinary lives but those of people subsisting in one of the harshest and most precarious human situations: the inhabitants/workers of the world's largest landfill, Jardim Garmacho outside Rio de Janeiro in Brazil. The film follows renowned artist Vic Muniz's project to collaborate with the dump's inhabitants on portraits of themselves made from the garbage that surrounds them. The resulting works



are large assemblages that extend the impulses of modernist collages, mixing postmodernist portraiture, conceptual art performance, community organising, and NGO-style charity work.

6. The trailer for *Trashed* supplies a useful encapsulation of the film's rhetoric of blindness and revelation: <http://www.youtube.com/watch?v=7UM73CEvwMY>
7. See for example Bill Moyers' two part television report *Trade Secrets* (March 2001). PBS.
8. Bennett 2010, p. vii.
9. Buell 1998, p. 642.
10. *Ibid.*, p. 639.
11. For more on cinema's role in making visible the invisible contagion, see Ostherr 2005. I am bracketing radiation and nuclear waste in my discussion for the sake of space and also because they are less rarely a central concern for recent popular documentaries. However, they are pertinent to the question of the visibility of the toxic. See for example Lippit's eloquent meditation on cinema's imbrication with the atomic.
12. Ivakhiv 2008 provides a useful synthetic overview of eco film theory.
13. Doyle 2009, p. 280.
14. Cubitt 2013, p. 281.
15. *Ibid.*, p. 280.
16. Angelone 2011.
17. Mills argues that the majority of nature documentaries impose heteronormative notions of sexual identity, coupling, and family onto the animal kingdom.
18. See Brereton 2005 on the sublime and the monumental for a different reading of how cinematic scale carries ecopolitical resonance.
19. Wheatley 2011, p. 248.
20. Ivakhiv notes that much of the ecocriticism that engages with the photographic and cinematic image regards the camera as an 'instrument of distancing, even of domination, enabling objectification, a decontextualization, a dehistoricization, and a commodification of the things that make up the world' (p. 17). For example, Willoquet-Maricondi goes so far as to suggest that the frame in eco film tames the world and the vitality of nature. The camera's 'enframing' enacts and repeats a kind of 'possession and mastery' of humans over nature (pp. 17-18).
21. Further study into the affinities of the digital video image and toxic could be considered here.
22. In *GasLand*, for example, a long take of a black polluted pond is thrown into sequence without any explanation of where it is or what it represents.
23. For more about how the toxic challenges environmental orthodoxy, see Buell 1998. Ecologically-driven critique has yet to make as systematic an impact on film theory as it has on Anglo-American literary studies. Some exceptions include Brereton, Cubitt, Ingram, and Murray. However, these books do not systematically address questions of documenting the toxic.
24. To expand Kracauer's comments, I am unpacking an implicit differentiation between *film* and *cinema*, with the former being an individual uninterrupted shot and the latter being the apparatus that conspires to create the final movie. Film alone can never be more than simply raw footage. It is cinema that gives us a movie in the classical sense, with all its textual and technical devices working towards an experience of narrative unity, where narrative content coheres the formal attributes of image and sound.
25. Kracauer 1997 (orig. in 1960), p. 54.
26. *Ibid.*, p. 40.
27. *Ibid.*, p. 285, 48.

## References

- Angelone, A. 'Talking Trash: Documentaries and Italy's "Garbage Emergency"', *Studies in Documentary Film*, Vol. 5, No. 2/3, 2011: 145-156.
- Bennett, J. *Vibrant matter: A political ecology of things*. Durham: Duke University Press, 2010.
- Brereton, P. *Hollywood utopia: Ecology in contemporary American cinema*. London: Intellect Books, 2005.
- Buell, L. 'Toxic Discourse', *Critical Inquiry*, Vol. 24, No. 3, 1998: 639-665.
- Cubitt, S. 'Everybody Knows This Is Nowhere: Data Visualization and Ecocriticism' in *Ecocinema theory and practice* edited by S. Rust, S. Monani, and S. Cubitt. London: Routledge, 2013.
- Dobrin, S., and Morey, S. *Ecosee: Image, rhetoric, nature*. Albany: SUNY Press, 2009.
- Doyle, J. 'Seeing the Climate? The Problematic Status of Visible Evidence in Climate Change Campaigning' in *Ecosee: Image, rhetoric, nature* edited by S. Dobrin and S. Morey. Albany: SUNY Press, 2009.
- Gustafsson, T., and Kääpä, P. *Transnational ecocinema: Film culture in an era of ecological transformation*. Bristol: Intellect, 2013.
- Ingram, D. *Green screen: Environmentalism and Hollywood cinema*. Exeter: University of Exeter Press, 2004.
- Ivakhiv, A. 'Green Film Criticism and its Futures', *Interdisciplinary Studies in Literature and Environment* 15.2, Summer 2008: 1-28.
- Kracauer, S. *Theory of film: The redemption of physical reality*. Princeton: Princeton University Press, 1997 (orig. in 1960).
- Lippit, A. *Atomic light (shadow optics)*. Minneapolis: University of Minnesota Press, 2005.
- Mills, B. 'The Animals Went in Two by Two: Heteronormativity in Television Wildlife Documentaries', *European Journal of Cultural Studies*, Vol. 16, No. 1, 1 February 2013: 100-114.
- Murray, R. *Ecology and popular film: Cinema on the edge*. Albany: SUNY Press, 2009.
- Ostherr, K. *Cinematic prophylaxis: Globalization and contagion in the discourse of world health*. Durham: Duke University Press Books, 2005.
- Rosen, P. 'Document and Documentary: On the Persistence of Historical Concepts' in *Change mummified: Cinema, historicity, theory*. Minneapolis: University of Minnesota Press, 2001, pp. 225-264.
- Rust, S., Monani, S., and Cubitt, S. *Ecocinema theory and practice*. London: Routledge, 2013.
- Wheatley, H. 'Beautiful Images in Spectacular Clarity: Spectacular Television, Landscape Programming and the Question of (tele)visual Pleasure', *Screen*, Vol. 52, No. 2, 20 June 2011: 248.

## About the author

Karl Schoonover teaches in the Department of Film and Television Studies at the University of Warwick (UK). He is the author of *Brutal Vision: The Neorealist Body in Postwar Italian Cinema* (University of Minnesota Press, 2012) and co-editor of the anthology *Global Art Cinema* (Oxford University Press, 2010). He has written on cinema's role in political culture, including essays on underground stardom in the 1970s, the humanism of HIV/AIDS activist videos, and the recent 'slow cinema' debates.



© 2013 Schoonover / Amsterdam University Press.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/2.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.