

**“Paradise is a little too green for me”:**

**Discourses of environmental disaster in *Doctor Who* 1963-2010**

***Lindy A. Orthia***

Throughout its history, the British science fiction television programme *Doctor Who* has engaged with many of the real-life scientific and political issues faced by human beings. Environmental problems have been a staple in the *Doctor Who* canon from as early as the programme’s second season in 1964 to as recently as 2008. Yet the programme’s representations of these problems – their causes, their effects, and their solutions – have changed significantly over that time. In this paper I examine these changes and find that the programme follows a trajectory of increasing resignation towards chronic environmental problems, and increasing disillusionment with the ability of the West – specifically Western science – to provide solutions.

The original series of *Doctor Who* was produced by the BBC more or less continuously between 1963 and 1989 and was revived in a continuing new series in 2005.<sup>1</sup> By the end of 2010, more than 200 serials in 32 production seasons of *Doctor Who* had been made, with each serial constituting a self-contained story told in one or more episodes. *Doctor Who* stories have been published in other media including films, audio plays and novels, but I do not discuss them here.

The central character of *Doctor Who* is an alien scientist known as “the Doctor” who travels through time and space with one or more companions

in a ship called the TARDIS, remedying injustices and solving technical problems. To date, eleven serials have engaged with environmental injustices and problems in depth. These provide the material examined by this paper. Their titles and the year they were first broadcast in the UK are:

Planet of Giants	1964
The Ice Warriors	1967
Colony in Space	1971
The Green Death	1973
Invasion of the Dinosaurs	1974
Robot	1974-75
The Seeds of Doom	1976
Kinda	1982
The Curse of Fenric	1989
Gridlock	2007
The Sontaran Stratagem/The Poison Sky	2008

These serials form five clusters that are unified chronologically and thematically: the 1960s, the early 1970s, the mid-1970s, the 1980s and the 2000s. I have organised the paper around these clusters and discuss each in turn, focusing on the role of Western science as cause and/or solution of the environmental problems.

### 1960s

The first episode of *Doctor Who*'s second season begins with the Doctor and his three travelling companions shrunk to tiny size on a suburban English lawn as a result of a TARDIS malfunction. At first they are puzzled as to what has happened to them and where they are. They encounter seemingly giant creatures – a worm, an ant, and a bee – all dead. They soon realise that the creatures are not giant, but that it is they who are small. They also realise that it is effluent from a laboratory that has killed these animals: effluent from a DDT-like insecticide called DN6. They are horrified at the devastation wreaked by the chemical, powerfully suggested through the “worm’s-eye” perspective. The Doctor and his companion Barbara make the pesticide’s negative ecological consequences clear:

Barbara: What would kill insects in a perfectly ordinary garden? I mean, pests one can understand. But surely it’s wrong to kill bees and worms and things?

Doctor: Quite so. Both are vital to the growth of things.

This serial is *Planet of Giants* (1964), the first *Doctor Who* story to provide

an in-depth treatment of an environmental issue. *Doctor Who* was created as a semi-educational programme designed to engage child viewers with science and history,<sup>2</sup> so it seems likely that this early serial was intended to engage viewers with environmental concerns. The influence of *Silent Spring*,<sup>3</sup> Rachel Carson's landmark 1962 environmental treatise about the ecological dangers of DDT, is obvious; indeed *Doctor Who* commentators have noted Carson's influence on *Planet of Giants'* scriptwriter Louis Marks.<sup>4</sup>

In this respect the serial is an interesting postscript to the string of "big bug" movies produced in Hollywood in the 1950s and early 1960s, which William Tsutsui has linked to concurrent fears of insect plagues and the institution of DDT-based eradication programmes across the USA.<sup>5</sup> Tsutsui notes that this genre of film stopped being made at the time Carson's book was published, in large part because of growing realisations about DDT's limited long-term effectiveness as well as its dangerous side effects.<sup>6</sup> A striking difference between the giant, mutant ants of Hollywood big bug films like *Them!* (1954) and the ants in *Planet of Giants* is their temperament: in *Planet of Giants* the "big bugs" are characterised as innocent victims "vital to the growth of things" rather than dangerous threats to be wiped out. The fact that their giant size is due to an altered point of view rather than an atavistic mutation reinforces this characterisation: it is we who must reconsider our actions, not them. Empathy rather than fear is the solicited viewer response to these creatures, making *Planet of Giants* something of a propaganda tool for anti-DDT sentiment.

Viewers are instead encouraged to direct their fear at the DN6 chemical and the means of its creation. That means is Western science. Specifically, it is two problematic kinds of science: that which is profit-oriented, and that which has failed to implement rigorous testing protocols, respectively embodied by two characters, Forester and Smithers. The development of DN6 has been funded by Forester, an entrepreneur who will stop at nothing to make money from the product. The research was performed by scientist Smithers, who failed to discover the chemical's destructive properties through proper testing, perhaps blinded by his proclaimed altruistic intentions to alleviate human starvation due to pest attacks on crops. These two are opposed by a third character, government scientist Farrow, who represents both the political establishment and scientific normativity. At the beginning of the serial Farrow confronts Forester with a report he has written, proposing a ban on DN6 because it kills everything. When Forester offers a bribe, Farrow refuses it, uniting scientific and ethical orthodoxy in his principled stand, saying, "This isn't business. This is science. The formula is unacceptable, and I can't ... allow DN6 to go into

production.” Forester then murders Farrow. But Smithers reads the report and is devastated by the findings, renouncing DN6. Thus, the ideological closure of the serial not only points to the evil of ecologically destructive pesticides, but to the triumph of establishment science over its rogue, profiteering cousin.

Being ignorant of the likely effects of his research, Smithers corresponds to the “helpless scientist” stereotype in Roslynn Haynes’ typology of scientist characters in Western literature.<sup>7</sup> Haynes links this stereotype and its message of “science out of control” to “anti-rationalist times,” which is consistent with Tsutsui’s claim that by the late 1950s, the shortcomings of DDT led the American public “to realize that neither the eggheads nor their chemicals were to be trusted.”<sup>8</sup> But *Planet of Giants* is far from being anti-rationalist, despite the presence of a “baddie” scientist, since it is Farrow’s meticulous testing of DN6, his transparent report writing, and his gentlemanly courtesy in alerting Forester and Smithers to the report’s contents, which ultimately wins the moral battle.

The ideological victory for establishment science is reinforced by the actions of the Doctor and his companions. Since they are miniature in size and cannot communicate with normal-sized humans, they must call on unconventional means to draw the attention of the authorities to Farrow’s murder. The strategy they choose is high school physics. Even at only a small size, they are able to manipulate “giant” matches, a “giant” laboratory gas jet, and a “giant” pressurised aerosol can to create an explosion in the lab. The explosion disables the gun-toting Forester, enabling a local police officer to arrest him and Smithers. Science, then, is both villain and hero. Environmental disaster is averted by the careful application of scientific principles, and order is restored via bureaucratic regulation and orthodox versions of truth.

The second environmentally-themed 1960s serial, *The Ice Warriors* (1967), also deals with a real-life scientific quandary. It is set on a dystopian future Earth beset by human-induced climate change. There has been widespread deforestation to make way for housing and artificial food factories, to service an overpopulated humanity. In a reversal of the real twenty-first century situation, cutting down all the Earth’s trees has resulted in reduced atmospheric carbon dioxide. This has caused a breakdown in the Earth’s greenhouse shield which heretofore trapped the sun’s heat, with consequent global cooling and continental glaciation. The story concerns the efforts of a group of scientists to contain the encroachment of glaciers across Europe, or else to allow “5000 years of history [to be] crushed beneath a moving mountain of ice.”

At the time *The Ice Warriors* was made, research into human-induced

climate change was being consolidated in the scientific community. Scientists in the 1960s and early 1970s were in some agreement that climate change was occurring, but were still asking questions about whether its net effect would be global warming or global cooling, and about the role of carbon dioxide in that process.<sup>9</sup> The concept was popularly linked to industrial pollution in 1968 by Paul Ehrlich's *The Population Bomb*, in which he wrote:

we cannot predict what the overall climatic results will be of our using the atmosphere as a garbage dump ... With a few degrees of cooling, a new ice age might be upon us ... With a few degrees of heating, the polar ice caps would melt, perhaps raising ocean levels 250 feet.<sup>10</sup>

*The Ice Warriors* may have provided a visualisation of those scientific speculations, allowing viewers to better engage with the ideas, although the serial seemed to prompt public debate about the details of ice age history rather than about future predictions.<sup>11</sup> *Doctor Who* scholars in later decades did not comment on the climate science in the serial either, instead linking scriptwriter Brian Hayles' inspiration to the discovery of a frozen mammoth.<sup>12</sup>

This may be because in *The Ice Warriors* itself the scientific controversies are not debated. More important to the story than the nature of the threat is the nature of the solution. As with *Planet of Giants*, the core conflict of the serial is an ideological war between different varieties of science. The scientists possess an "ioniser" – the technology needed to contain the glacier – but using it is somewhat dangerous and poses a risk to their base. In addition to the technology, they need the ethical reasoning capacity to evaluate the risk and the conviction to use the ioniser if necessary. For the most part, they lack these. Within the group there has been a rift between the majority, who depend upon the advice of a computer and refuse to make decisions without it, and the individualistic lead scientist Penley, who detests the computer, and protests against becoming a "robotised human", "sucked into that computerised ant-heap you call a civilisation." The self-interested logic of the computer prevents it from offering useful advice because all choices entail risk to its own existence. This leads to inaction, which brings the glaciers ever closer. Ultimately the Doctor convinces Penley to take charge of the operation, since only his combined talents of human judgement and scientific reason can make appropriate decisions. Penley agrees, and uses the ioniser competently, saving the base from both the glacier and the ioniser's dangerous potential effects.

Viewers are thus presented with a model of what a scientist ought to be: creative, rational, independent and free. Penley is portrayed as an

Enlightenment hero, striking a blow for the Kantian ethical subject whose independent reason sees moral truth clearly and whose freedom from social conventions allows him to act on that truth. Kant articulated the philosophy of Enlightenment this way:

Enlightenment is man's emergence from his self-imposed immaturity. Immaturity is the inability to use one's understanding without guidance from another. This immaturity is self-imposed when its cause lies not in lack of understanding, but in lack of resolve and courage to use it without guidance from another.<sup>13</sup>

Under this philosophy, reason wielded by a free individual represents a fundamentally different ethic than logic wielded by the conditioned, artificial consciousness of the computer, or from the reasoning of people who are dependent upon its advice. It is this purely Kantian variety of scientific reasoning and scientific practice that triumphs in *The Ice Warriors*, overcoming the supposed inefficiencies and inadequacies of the self-interested and the weak-minded, to drag humanity into the age of Enlightenment.

While this is not identical to the version of scientific orthodoxy represented in *Planet of Giants*, it is consistent with it. Smithers' reason is contaminated by altruistic subjectivity, Forester's by self-interested greed, the computer's by self-preservation, and that of its followers by moral feebleness and fear. All are restricted in their intellectual freedom by vested interests. Conversely, both Farrow and Penley are guided by Enlightenment scientific ideals of objective, free thought and the boldness to act with the courage of their convictions. They respectively embody two utopian principles of Western Enlightenment, commonly touted as the qualities that grant the scientific establishment its institutional place in a liberal democracy: democratic scrutiny and intellectual freedom. In being "goodie" scientists who occupy the moral highground, these characters are celebrations of the capacity of orthodox Western science to mitigate both environmental disaster and the worst excesses of irresponsible technological development.

### 1970s

The faith in science depicted in environmentally-themed serials of the 1960s was to continue in the early 1970s, but with a political transformation. In two 1970s serials, "goodie" science was represented by scientists or scientifically-minded characters committed to an alternative lifestyle outside of industrial capitalism. The scientist villains in both serials were politically-endorsed, mass-scale, profiteering industry; in other words, the reign-

ing scientific establishment. Two of the tendencies from the 1960s serials – the profiteering of Forester, and the global-governance and synthetic lifestyle of humanity in *The Ice Warriors* – were thus brought together to make a more powerful enemy for humanity in the 1970s, and one that had to be overcome by radical means rather than through the assertion of establishment authority.

In *Colony in Space* (1971) a group of people from a dystopian future Earth have colonised another planet, on which they attempt to eke out an egalitarian, small-scale agrarian existence. They have not rejected science altogether, for example their colony is powered by a nuclear generator, but they have rejected the over-regulated society on Earth, which, in the words of one colonist, is characterised by “no room to move,” “polluted air,” “not a blade of grass left on the planet,” and “a government that locks you up if you think for yourself.” Life on Earth, then, is both environmentally depauperate and politically repressive; so much so that “tens of thousands die on Earth every day from epidemics, suicides, traffic accidents [and] pollution.” The colonists’ agricultural initiatives fail though, and they are not sure why. It transpires that the problem is a “devolved” indigenous civilisation whose military technology has literally become poisonous to the land. Poison-induced sickness has also caused the indigenous people to lose their ability to manage the technology, because, as the Doctor notes, their “science has deteriorated into a somewhat primitive religion.” The problem is solved when the leader of that civilisation genocidally sacrifices himself, his people, and the poisonous remnants of their technology to allow the colonists’ crops to thrive.

This storyline is problematic with respect to its implicit endorsement of *terra nullius*-style colonialism,<sup>14</sup> but that aside, arguably the serial’s explicit theme is the dire consequence of society becoming overly developed with techno-industrial infrastructure. That message is refined in the second, parallel storyline of the serial, which concerns the aforementioned scientist villains. They are the Interplanetary Mining Corporation (IMC), a consortium of profiteering industrialists whose employees move from one planet to the next, reducing each “to a galactic slag heap,” in order to maintain the infrastructure of the overpopulated Earth and to make money. The colonists must not only compete with the indigenous civilisation for space, but must expel the IMC from the planet if they are to live in peace. This storyline is resolved by the turncoat actions of one of the IMC’s junior engineers and a strategic suicide by the colonists’ over-cautious and conservatively reformist leader. It is thus youthful radical democracy as well as environmental sustainability that win the moral victory, with the old guard swept aside, allowing “the people” to found a new paradise.

In *The Green Death* (1973), radical democracy and environmental sustainability are foregrounded as common goods even more strongly than in *Colony in Space*. Set in South Wales in the present day, the heroes of the story are again a group of hippy scientists, and the villain a corporation. Global Chemicals has established a plant in a former coal mining town to produce petrol using a new, extraordinarily efficient method for refining oil. The company has the endorsement of the British government, and the out-of-work coal miners are pleased at the prospects for employment offered by the plant. But Global Chemicals is opposed by a young Nobel Prize-winning biotechnologist, Professor Cliff Jones, who lives nearby in a hippy commune called "Wholeweal," known locally as "the Nut Hutch." Jones' fellow commune residents are also scientists, applying their minds and bodies to developing sustainable technologies. They seek to promote renewable energy sources such as solar, wind, hydroelectric and geothermal power instead of fossil fuels. They are also developing a protein-rich fungus to "feed the world" as an alternative to meat, and they consider communal living and self-actualisation to be the ways forward for humanity.

Global Chemicals' Director uses the language of resource conservation to defend his highly efficient refining process, boasting of its "negligible" waste products. But his conservationist rhetoric is undermined by the more radical notion of sustainability offered by Jones and his comrades. Global Chemicals' refining process is soon found to be extremely dangerous to health and environment, because its "negligible" by-product is a toxic green sludge. The company pumps this "green death" down a disused coal mine, where it poisons and kills some of the caretaker miners. The sludge is also the perfect breeding ground for a clutch of maggots, which grow to gigantic size and infest the surrounding countryside, unable to be killed with standard weaponry. Similar imagery had previously been seen in *Inferno* (1970), in which over-zealous deep drilling for an unlimited energy source yielded toxic green sludge and global destruction, though *Inferno* lacked overt environmentalist rhetoric. In *The Green Death*, the symbolic victory for sustainable science and radical democracy is won when Jones' protein-rich fungus provides the antidote to the green sludge. It saves human lives by neutralising the toxin, and saves the environment by killing the maggots. Jones then effects a local-scale economic "revolution" by securing an "unlimited" research grant from the United Nations, with which he can solve all manner of problems and even give jobs to the coal miners ("work for the valleys," he says).

*The Green Death* and *Colony in Space* are just two 1970s BBC television programmes which celebrated and explored "back-to-the-land" movements. Other such programmes include the post-apocalyptic drama *Surviv-*



vors (1975-77) and the sitcom *The Good Life* (1975-78). *Survivors* and *The Good Life*, as well as *Colony in Space*, in some respects constitute romanticisations of an imagined pre-modern rural utopia, idealising, to borrow Rachel Morgain's words, a "stereotyped vision of gentle earthly bounty brought forth by modest hands in spiritual synch with nature's temporality": the kind of Romanticism critiqued in Raymond Williams' *The Country and The City*.<sup>15</sup> But environmentalism is strongly linked to technological development in *The Green Death* (and to a lesser extent in *Colony in Space*), since this serial implies that it is only through science's sustainable applications that humanity can ultimately be freed from our reliance on polluting fossil fuels and exploitative industrial capitalism. As Jones explains:

Jones: We haven't set up this community just to drop out. I mean let's face it, who does like the petrol-stinking, plastic, rat-trap life we all live? No, no. If we're going to make a success here at Wholeweal, we've got to do something that's going to help the entire world. So we're a biotechnic research unit as well as a nut hutch.

Jones' biotechnological research into the protein-rich fungus references contemporaneous Green Revolution discourses in which "new food" symbolically demarcated the modern from what came "before."<sup>16</sup> *The Green Death* thus breaks from the Romantic tradition by looking "forward" not "back," at the same time as role-modelling an environmentally friendly, community-based, self-sufficient lifestyle. As with the 1960s serials, science remained the saviour in the early 1970s, though only if it was accompanied by an appropriate political ideology. John Fiske in 1984 described this tension between "good" and "bad" science as integral to the *Doctor Who* formula:

In story after story in *Dr. Who*, "pure" or "cold" science is used to maintain or establish a totalitarian political order. Science is a means of power in an intergalactic version of feudal society. The Doctor typically defeats a totalitarian, scientific antagonist and replaces him or her with a liberal democratic humane scientist to take over and bring justice and freedom to the oppressed serf class.<sup>17</sup>

Fiske's articulation of the formula is significant not only for its identification of the centrality of science, but because it accurately describes the "goodie" scientist as "taking over." Even in *The Green Death*, with its depictions of grassroots protests by the hippy scientists and its evocation of real-life popular environmental movements, the scientist is saviour rather than one of "the people." Jones in the end obtains his research grant through the Doctor's companion's ruling class connections with the UN, and then (we

presume) becomes an employer of the working class coal miners, the victimised “oppressed serf class” of Fiske’s model. As a contributor to the Green Revolution with global plans for his lab-built agricultural products, his gaze is as imperialistically totalising as that of Global Chemicals.<sup>18</sup> In other words, his radical sustainable future probably maintains the power structures of the present, thus falling short of a truly revolutionary vision.

Despite this, compared to what was yet to come in environmentally-themed *Doctor Who* serials, *The Green Death* remains one of the most overtly radical stories in the programme’s history, presenting an unequivocally didactic message in favour of sustainable living, renewable energy and altruistic food science. It did not take long for this enchantment with utopian environmentalism to be turned on its head in favour of a reactionary preference for the modern industrial capitalist status quo.

### **The Mid-1970s**

Just two serials after *The Green Death*, in *Invasion of the Dinosaurs* of 1974, environmentalists began to be characterised as green fascists who want to impose their views on “us” and destroy the beauty and contradictions inherent in liberal democratic modernity. Disaster is presaged when dinosaurs appear on the streets of London, only to disappear minutes later in unexplained circumstances. London is evacuated, leaving the streets quiet and empty, while the Doctor and the military outfit he is occasionally allied with, UNIT, investigate. They find out that the dinosaur visitations are the result of “Operation Golden Age,” time experiments by a group of environmentalists who inhabit the highest echelons of society: front bencher the Right Honorable Charles Grover, esteemed scientist Professor Whitaker, and a military man, General Finch. Their scheme is to turn back time on planet Earth and erase millennia of human history from ever having happened. They want the Earth to be a green paradise again, and for humans to evolve in harmony with nature, to maintain both a pollution-free environment and a pollution-free morality. Their venture is supported by other privileged-class conservationists – House of Lords member Ruth, novelist Adam, and medal-winning athlete Mark are those we meet – who are to be kept safe from the time experiment, but are not told of the details. The latter are tricked into believing they are flying on a spaceship to another, greener, world “at an earlier stage of development,” which is “still pure, undefiled by the evil of man’s technology,” and inhabited by “simple pastoral people, innocent and unspoiled.” In this the characters mirror the back-to-the-land Romanticism of the colonists in *Colony in Space*, but in this case their utopianism is found to be genocidally naïve.

The environmental and scientific credentials of this mob are impressive. Grover started the “Save Planet Earth Society” and wrote a book entitled “Last Chance for Man.” Ruth, known as Lady Cullingford before climbing aboard the “spaceship,” backed a Private Member’s bill against the pollution of rivers. Whitaker, too, is considered to be “brilliant” by his former Oxford colleagues, the science editor of *The Times*, and the editor of *Nature*. Nonetheless, their proposed solution to environmental crisis is condemned by the Doctor and his companions as “an atrocity.” Companion Sarah champions modernity, expressing distaste for the silent, evacuated London, preferring it the way it was, “traffic jams and all.” She disputes the pessimism of the “spaceship” inhabitants, who decry humanity’s “moral degradation, permissiveness, usury, cheating, lying, cruelty,” by countering that “there’s also a lot of love and kindness and honesty.” Ultimately it is the environmentalists who are found to be problematic, as either evil plotters or ineffectual dupes. Their class status also seems to damn environmentalism as elitist and out of touch with reality: they are not the ordinary working folk of *Colony in Space* or the communalist hippies of *The Green Death*. At the end, Ruth, Adam and Mark recant once the truth has been revealed to them, and send Grover and Whitaker back in time to the age of the dinosaurs, to which the Doctor remarks, “Back to their golden age, and I hope they like it.”

This “soft-modernist” backlash against environmental extremism is a defensive reclamation of the liberal status quo. The environmental utopias of the villains are framed as dystopian nightmares for the rest of us and something to be rejected. No alternative environmental solutions are offered by the serial, even though in the denouement the Doctor tokenistically agrees that there is a problem. When UNIT commander the Brigadier expresses the view that Grover was “mad,” the Doctor counters with an impassioned speech:

Doctor: Yes, well of course he was mad. But at least he realised the danger that this planet of yours is in, Brigadier. The danger of it becoming one vast garbage dump inhabited only by rats.

Brigadier: It’ll never happen, Doctor.

Doctor: It’s not the oil and the filth and the poisonous chemicals that are the real cause of pollution, Brigadier. It’s simply greed.

“Greed” here is ill-defined, so it is unclear who or what is being identified as the most productive locus for action. It seems a mere gesture to a non-controversial moral consensus rather than a substantial argument, especially given the villains in this case were motivated by Romanticism, not

greed. The statement may mitigate against the anti-environmentalist flavour of the story, but only in a confusing way.

Ruling class, out-of-touch environmentalists are in abundance in *The Seeds of Doom* (1976), whose principal villain is millionaire botanist Harrison Chase. Chase collects and nurtures rare plants on his estate, and in his first scene speaks of his “mission to protect the plant life of Mother Earth.” He is also a fanatical composter, never wasting “anything that could be used to fertilise his plants.” But behind this genteel conservationist facade is a bizarre streak: he also demands government action on the “hideous, grotesque” practice of bonsai, and describes hybrid plants as “a crime against nature.” When an alien plant monster threatens to wipe out all animal life on Earth – the central plot of the serial – Chase tries to help it succeed, and in doing so is finally mulched by his own compost machine.

Opposing Chase are three more environmentalists: an eccentric botanical artist, Amelia Ducat, and two civil servants from the World Ecology Bureau, Dunbar and Sir Colin Thackery. Ducat is charming and effective, but is the artistic equivalent of a nutty professor, distracted by memories of past plants she has painted. Dunbar is a traitor who steals the alien plant pod from the Bureau and sells it to Chase for a princely sum, enabling Chase to germinate and grow the alien species. Sir Colin, while on the side of good, is ineffectual. He is mocked by the Doctor, who is trying to explain the threat posed by the alien: “If we don’t find that pod before it germinates, it’ll be the end of everything. Everything, you understand? Even your pension!”

This caricaturing of environmentalists is accompanied once more by a defensive embrace of comfortable liberal modernity against those who might try to make us “do something” about the environment. Sarah again provides a voice of liberal “sanity,” countering Chase’s affection for his plants with the comments, “I’ve heard of flower power but that is ridiculous,” and “you’ll all flower happily ever after.” The Doctor expresses little sympathy for environmental measures, except as a sarcastic remark about composting being “very commendable” when he is threatened with being composted himself. Ultimately it is well-aimed missiles that destroy the alien plant, cementing an ideological closure that celebrates the establishment status quo, albeit its military aspects rather than the science celebrated in the 1960s serials. Environmentalism emerges from *The Seeds of Doom* looking somewhat ridiculous.

*Robot* (1974-75), falling chronologically between *Dinosaurs* and *Seeds*, is the third major component of the mid-1970s cluster. One of its villains, Professor JP Kettlewell, is a green eccentric who literally aligns himself with fascists to achieve his desired environmental ends. Kettlewell has

invented a powerful, sentient robot to replace humans in dangerous workplaces, and the substance of the serial concerns this robot getting out of control, growing to giant size, and killing people. This occurs in part because it is employed for evil ends by Kettlewell's colleagues, scientists Winters and Jellicoe, who wish to take control of the world. Winters is leader of the ultra-rationalist "Scientific Reform Society," a para-military fascist organisation whose uniforms and logo resemble those of the Nazis and who wish to impose a more rational mode of government on the world. Kettlewell initially breaks ties with Winters and Jellicoe, wanting to pursue research into "alternative technology". Counted amongst his environmentally-minded inventions are a solar battery and a virus designed to break down waste metal. But it is soon revealed that Kettlewell too has joined the Scientific Reform Society out of frustration at environmental inaction. He explains, "For years I've been trying to persuade people to stop spoiling this planet, Doctor. Now, with the help of my friends, I can make them." Like Whitaker, Grover, and Chase, Kettlewell meets with poetic justice in the end, killed by the robot he created, although after his death the metal virus comes in handy as the weapon that defeats the robot.

While the focus of *Robot* is on the spectacle of the robot itself, there is, once again, an implicit critique of extremist environmentalism here. As in *Invasion of the Dinosaurs*, the Doctor agrees with Kettlewell's advocacy of solar energy, but he criticises the mechanism by which Kettlewell chooses to defend it, stating, "in science as in morality, the end never justifies the means." Perhaps he is correct, but once more no real alternative is offered. The Doctor knows what Kettlewell must do to make his solar battery work, but he does not take up the mantle of fighting for its implementation once Kettlewell is gone, nor does he share the technological secret with viewers.

This is echoed in a serial from the next season, *Terror of the Zygons* (1975). Arriving in Scotland near oil drilling operations in the North Sea, the Doctor is disgusted at having been summoned to deal with the destruction of an oil rig:

Doctor: Oil an emergency! Ha! About time the people who run this planet of yours realised that to be dependent upon a mineral slime just doesn't make sense. Now the energising of hydrogen –

But the thought is never finished, and the environmental issue is not mentioned again, as the plot immediately moves on to a story about alien invasion. Similarly, in a late 1970s serial, *Nightmare of Eden* (1979), a zoologist who has invented a technology for conserving whole ecosystems as electromagnetic signals is criticised by the Doctor for conserving endangered species "in the same way a jam maker conserves raspberries." Once more,

no alternative is offered. In any case, the zoologist turns out to be a drug courier, and the theme of drug addiction is the serial's main concern.

Perhaps what these seemingly throwaway pro-environment comments by the Doctor demonstrate is an editorial desire for action to be taken on these fronts: for capitalist profiteering at the environment's expense ("greed") to be stopped, sustainable energy sources to be researched, and biodiversity to be effectively conserved. What is interesting, then, is why stories were not built around these points: why environmentalist inventors and green adventurers were not the heroes of mid-1970s serials, in the tradition of Farrow, Penley and Jones. Instead, the only effective "hero" voice in favour of environmentalism is that of the Doctor, but his actions do not back his convictions. *Doctor Who* at this point in its history seems to have lost its faith or its interest in the ability of Western science to tackle environmental issues, instead resorting to ideological name calling. Utopian idealism of *The Green Death* variety has disappeared. Many serials of the time, including *Robot* and *The Seeds of Doom*, were markedly scientific in their ideological viewpoint, as I have argued elsewhere.<sup>19</sup> But this scientism largely manifested as the demystification of "irrational" beliefs as primitive or mad, rather than presenting science as a potential solver of technical problems. There seems a reluctance in this era to exhibit too much credulity about Western science's practical utility, even if the programme's producers held out hope and belief that Western science was the way forward for humanity. One could argue that this emphasis on problems but not solutions is a conscious decision to refuse the tyranny of totalising utopian visions, by advocating instead a utopia which is, as Alec Charles has put it, "not the perfected state of fundamentalism, but the aspirant condition of a critical humanism".<sup>20</sup> Yet even the "critical humanism" in mid-1970s *Doctor Who* is fairly unambitious.

So what led to this dramatic shift between 1973 and 1974? While there were changes in the *Doctor Who* production team in the mid-1970s, there was considerable overlap between *Colony in Space*, *The Green Death*, *Invasion of the Dinosaurs* and *Robot*, so this is an unconvincing explanation, and we must look to external influences. To begin with, the dates correspond to the collapse of the post-war economic boom in Britain, resulting in economic recession. One consequence of this was diminishing government spending on environmental works by the newly elected second Wilson Labour government, a trend that continued through to the 1980s.<sup>21</sup> In addition, there were changes in public attitudes to science taking place around this time. The post-war era had seen considerable public optimism towards science and technology, fuelled by the development and expansion of science funding, policy, education, and research programmes.<sup>22</sup> In 1960s

Britain, large sectors of nationally-funded military research were turned over to civilian purposes and private interests under the first Wilson Labour government, which promised to “forge a new Britain that would succeed in the ‘scientific revolution’.”<sup>23</sup> But this investment failed to boost Britain’s economy as much as commentators hoped, resulting in the widespread realisation that there was generally no correlation between investment in civil research and development and economic growth.<sup>24</sup> This may be why the value and primacy of science were increasingly questioned in the public arena during the 1960s, and the public status of science had fallen by the end of that decade.<sup>25</sup> It is difficult to tell, though, whether this is related to the cynical negativity towards green scientists and relative complacency towards environmental problems in mid-1970s *Doctor Who*. In any case, this era of *Doctor Who* was the beginning of a decline in serials that valorised Western science and took environmental problems seriously. Whether for political or aesthetic reasons, environmentalist heroes had fallen out of fashion.

### The 1980s

*Doctor Who* returned to a more didactic approach to environmental questions in the 1980s, but within a particular context: European colonialism. The exemplary serial of this cluster is *Kinda* (1982), a complex story melding themes of European expansion with Buddhist concepts and Christian creation stories, which has been the subject of in-depth analysis by *Doctor Who* scholars.<sup>26</sup> *Kinda* concerns a colonial enterprise by European-style interplanetary colonisers on the planet Deva Loka. The planet is a green paradise in which the indigenous people, the Kinda, live in collectivist harmony with nature and possess minimal infrastructural development. Their collectivism is emphasised by the fact that they communicate telepathically and are mute. The colonisers, who don pith helmets and khaki reminiscent of Victorian Africa-grabbers, consider the Kinda to be “a bunch of ignorant savages” and enslave some of them. But four members of the coloniser party disappear when exploring the planet, driving the junior officer left in charge mad. This officer, Hindle, develops a pathological fear of the jungle outside:

Hindle: Spores. Particles of generation. Microscopic. Everywhere. Eh, Doctor? Or rather ...

Doctor: Rather what?

Hindle: Fungi.

Doctor: Oh?

Hindle: Bacteria. Or even worse, virii. As in virulent. Am I getting warmer? Change and decay in all around I see. Eh? Out there! Growth. Everywhere. At random, higgledy-piggledy. But for what purpose?

Hindle is particularly afraid of the organisms he believes to be in charge: the trees, with their “Seeds. Spores and things. Everywhere. Getting hold. Rooting, thrusting, branching. Blocking out the light.” He devises a plan to protect the colonisers’ base, the Dome, from this threat:

Hindle: I wish to announce the strategy for defence of the Dome. Implementation: immediate. We will raze to the ground and sterilise an area of forest some 50 miles radius. Objective: the creation of a cordoned sanitaire around the Dome. Method of implementation: fire and acid. Acid and fire.

To achieve this, Hindle wires the Dome with explosives, a move which will destroy him too. Thus, drives to imperialist expansion, colonialist domination, and environmental devastation are linked to a pathological impulse to control the unknown, by killing it and oneself if necessary. They are also linked to patriarchal militarism: the only coloniser who maintains her sanity, her pacifism, and her belief that *Deva Loka* should not be colonised is the female scientist, Todd.

The serial implies that the *Kinda* have found a way of living outside of these destructive impulses and drives. They have no leaders, but are spoken for by two wise women – the only *Kinda* who “have voice” – and a mute male trickster. By the serial’s end the *Kinda* restore Hindle to sanity by means of a mystical technology, the Box of *Jhana*, which dissipates his pathological fear by exposing him to a vision of the utopian *Kinda* life. Hindle and his senior officer, Sanders, who has also returned to the Dome a cheerful peacenik after experiencing the Box of *Jhana*, decide to stay on *Deva Loka*, but not as colonisers: they wish to disappear into the jungle to live out their days.

*Doctor Who* dealt with colonialism and imperialism many times before *Kinda*, and sometimes depicted environmental devastation as a consequence of colonialist projects and the imperialist exploitation of resources. For example, in *The Mutants* (1973), Earth colonisers’ terraforming activities disrupted the ecological processes essential to an alien people’s survival. But *Kinda* was the first serial to suggest imperialism and eco-destruction are pathologically intertwined at the diseased root of Western culture, rather than treating environmental devastation as a side effect of



industrial development. In this sense it is profoundly damning of the West's capacity to address environmental problems, because in *Kinda* the role models of sustainable living are the decidedly non-Western Kinda.<sup>27</sup> It is interesting, then, that at the serial's end, both Todd and the Doctor – the sole voices of “sanity” among the Westerners – reflect that they do not wish to stay on this planet and live like the Kinda. Todd says “paradise is a little too green for me,” and the Doctor echoes this statement in his final line. As in the mid-1970s serials, this implies an embrace of the Western condition, despite its faults. However, no Western-style society is depicted outside of the coloniser Dome, because *Kinda* deals with these issues in the abstract, driving its point home through philosophical rhetoric and allegory rather than futuristic realism. In this it provides no solutions to any environmental devastation that may have taken place in the real world, bar a complete separation of the West and the rest. The preservation of indigenous cultures, uncontaminated by Western modernity, is the only way to maintain environmentally utopian potentialities, according to *Kinda*. Westerners are left to consider their options, but elsewhere: in a place that is decidedly not “paradise.”

*Kinda* was not the only 1980s serial to peel back the surface and reveal the corrupt foundations of Western culture. *The Curse of Fenric* (1989) concerns a British military research facility during the Second World War which develops a cache of lethal chemical weapons from a natural toxin that springs from the ground. Leading the facility from the military end is General Millington, whose mission is to end the war by dropping chemical bombs on German cities, and also to deliver the poison into the Kremlin to disrupt the USSR once the war is over. He is assisted by an Alan Turing-like scientist, Professor Judson, who invents a code-breaking machine that contains the poison: the Trojan horse which Soviet soldiers have been “invited” to steal. Made at the last gasp of the Cold War, at the end of a decade of nuclear fearfulness, *The Curse of Fenric* lays the blame for global environmental devastation at the feet of nationalism. The poison, we discover, will not merely kill Germans and Russians: it will ultimately cover the Earth in a chemical slime. Humans will evolve into blood-sucking creatures called Haemovores to adapt, but eventually even these will not be able to survive in the chemical wasteland. The plan is foiled when one of the Haemovores comes back through time to end it before it begins, thus wiping his own existence out of future history and saving the world from the chemical dystopia. An alternative future for humanity is offered when a British and a Soviet soldier join forces rather than fighting each other, proclaiming “workers of the world unite!”

While not as profoundly challenging to the roots of Western civilisation

as *Kinda*, this serial contains echoes of *Kinda*'s sentiments if we consider Millington's nationalist fearfulness and arms race to be the progeny of Hindle's imperialist fearfulness and suicidal explosives. In addition, like *Kinda*, *The Curse of Fenric* offers utopian potentiality solely in global revolutionary change. Still, this is only implied. The soldiers' statement of worker solidarity is not as boldly pronounced as Jones' advocacy of renewable energy sources or the *Colony in Space* colonists' attempts to live in self-sufficient harmony. Whereas the early-1970s serials showed characters proactively engaged in making new lifestyles within a Western scientific framework, in the 1980s Westerners are only reactive. Like *Kinda*, *The Curse of Fenric* is articulate in identifying the ideologies responsible for "the problem," but is not forthcoming with specific alternative solutions, only the idealist notion of a socialist paradise. Certainly, the days of Western scientist heroes or the Western establishment solving environmental problems were long past.

### The 2000s

This seeming inability to solve large-scale environmental problems through Western scientific means continued in the new series. Not that the programme has been unwilling to take on contemporary issues: it has taken on others such as animal rights (*New Earth* (2006)) and refugee internment (*Turn Left* (2008)). *Doctor Who* just seems to be uninterested in addressing the climate change-related environmental devastation of which Westerners in the twenty-first century are acutely aware.

At the time of writing, only two serials have dealt with environmental devastation in the new series of *Doctor Who*. The most explicit, the two-part serial *The Sontaran Stratagem / The Poison Sky* (2008), is set on Earth of the present day. A technological gadget called "Atmos" has been installed on cars the world over, in order to filter out and neutralise polluting gases. It becomes apparent that this utopian climate change solution is actually a terraforming tool for an invading alien race. When triggered, the Atmos devices start releasing alien gas, and the Earth is covered in a poisonous smog. The Doctor easily solves the problem by constructing a mysterious and unexplained gadget that sets fire to the poisonous gases and clears them from the sky. Inexplicably this does not set fire to anything else, so the science is not remotely convincing, nor explained: the solution is alien magic. *Gridlock* (2007) is similar. It depicts a future Earth colony caught in a dystopian scenario more satire than allegory: a worldwide traffic jam. The entire population of the planet New Earth live in their hover cars in a self-contained, underground, multi-lane highway. The traffic barely moves

and the outside atmosphere is toxic with pollutants, so each car is a small, self-sufficient “house” in which even human waste is recycled as food. The problem turns out to be remarkably benign: a broken-down computer system which automatically closed the underground city when a disease broke out on the surface. Again, the Doctor fixes the computer with unexplained alien jiggery-pokery, and the people are freed.

In both serials the climax is very much a hero moment for the Doctor as alien genius, and this tends to overshadow any possible deeper messages about greenhouse gases and pollution. To use Hugh Ruppersberg’s term, the Doctor functions as an “alien messiah,” saving humanity from itself.<sup>28</sup> Ruppersberg critiques alien messiah figures as anti-rationalist, because human characters invariably become their feckless disciples rather than being empowered to use their own rational faculties to solve problems. Certainly, in the new series of *Doctor Who* the Doctor is more saviour than scientist, and in contrast to the original series never calls himself a scientist. This point is reinforced in the 2007 finale *Last of the Time Lords*, which sees the entire population of Earth literally praying “Doctor” in order to defeat the serial’s villain (it works!). On the other hand, it could be argued that “alien magic” solutions grant rhetorical power to science and technology, but – significantly – without a real-world institutional or ideological context to anchor it. Either way, these resolutions are not strongly empowering statements for dealing with real-life environmental disaster.

In any case, *The Poison Sky* uses discourses of climate change to indicate that the story should not be interpreted as a metaphor at all. One of the characters in the serial remarks, while choking on the poisonous alien gas, “all those things they said about pollution and ozone and carbon – they’re really happening, aren’t they?” Yet the Doctor clarifies that these poisons are not greenhouse gases, but are something else: the work of aliens, rather than human beings. By specifically referencing climate change and discounting it as an explanation, the story loses its allegorical potency. A similar scene in *Doomsday* (2006) reinforces this insistence on not reading deeply into events. Yet again, an alien invasion causes atmospheric changes: in this case a temperature rise. Once more, “global warming” is raised as a potential explanation by those suffering from it, but dismissed, ensuring viewers focus solely on the fictitious scenario. Climate change in these serials is treated as a notion that ordinary, twenty-first century English publics are acutely aware of, but not as something it is *Doctor Who*’s role to address.

In this treatment of environmental themes, the new series of *Doctor Who* is distant from the moralising of the original series, which in all eras sought to comment on current events, and very far from the series of the

1960s and early 1970s, which were clear in offering solutions. Science is present, but its presence is cartoonish rather than offered didactically as a serious tool. The ability of humans to manage our own problems is challenged by our dependence on a saviour: neither the West nor the rest have anything more to offer. In addition, human characters in this era exhibit considerable complacency towards chronic environmental problems. The people in *Gridlock* accept their lot: they do not see anything untoward in a society based on a traffic jam. In *Bad Wolf* (2005), set on a space station orbiting a future Earth, we see the Earth covered in grey pollution, and are told by a cheerful and accepting resident that the air is usually unsafe to breathe and that a “Great Atlantic Smog Storm” has been raging for twenty years. In *Cold Blood* (2010), humans negotiating with sentient reptiles to share Earth note that our planet cannot sustain its human population. Again, these are throwaway lines: there is a sense of shrugging resignation about them and the serials soon move on. *Doctor Who* in the twenty-first century reflects a society and culture that has grown used to the environment being devastated, that sees no way out of this situation, but that expects humanity, specifically the Western lifestyle, to continue regardless. In the age of the Fourth IPCC report,<sup>29</sup> and despite critically important global debates about humanity’s role in transforming and possibly destroying the planet, the systemic causes of environmental problems remain as unspecified as the solutions. The 1980s’ location of the problem at the rotten foundation of Western society has been lost, and the earlier decades’ finger pointing at industrial capitalism – a prominent feature of twenty-first century climate change debates – is nowhere to be seen. The apolitical pleasures of Western modernity – chips, edible ball bearings, and television – are celebrated, while species die and the planet fries.

### **Does it matter?**

There are two obvious ways we can read this state of affairs. The first is to treat *Doctor Who* as a reflection of contemporaneous concerns and attitudes, and I have attempted to comment on these above. It is clear that things have changed since 1964. Certainly, if we can say nothing more, a review of environmental *Doctor Who* serials can tell a history of the environmental issues preoccupying a significant sector of the public, and the solutions touted (or not touted) at the time.

Alternatively we could go further and insist that *Doctor Who*, like other science fiction, has a responsibility to attempt to “change the climate.” If we consider this an important function of fiction, then we must ask: which *Doctor Who* era was the most successful at raising awareness about environ-

mental matters?

In the absence of audience data on this specific question, we must look to related studies to estimate the effectiveness of each approach. It is tempting to suggest that the approaches of the early 1970s or the 1980s were the “best” because they aspired to radicalism, or that the 1960s and early 1970s were “best” for trying to offer realistic solutions. The other eras are easy targets for criticism: the mid-1970s for its reactionary backlash, and the 2000s for apolitical complacency. This is not necessarily the way serials from these eras are received though. For example, although the mid-1970s “envirofascists” were villains, and were condemned by the hero Doctor for their actions and their dreams, at least their extreme green ideas were made available for discussion. Undoubtedly, in the mid-1970s, environmental ideas were broached more often than in any other cluster.<sup>30</sup> Viewers may then read against the text and barrack for the villains if they choose. My own emotional response to *The Seeds of Doom* is to want Harrison Chase and the plant monster to win, so that they may create “a new world, silent and beautiful” that has no people in it. In other words, I sympathise with the enviro-villain rather than the hero who defends Western modernity. Thus, although it is relatively straightforward to determine the ideological formula of *Doctor Who* serials,<sup>31</sup> viewer response is not so predictable. Perhaps the real point here was made by Joan Haran and colleagues, who observed that television series offer greater scope than other forms of fiction for engaging deeply with complex social issues, because each episode can tackle the same problem from a different angle.<sup>32</sup> It may be that all of the environmental discourse throughout *Doctor Who*’s history contributes to a 50-year-long consciousness-raising exercise, presenting a range of alternative perspectives, which a single didactic story could not do so on its own.

Environmental messages expressed as throwaway lines might also “hit home” more effectively than messages delivered through the core ideological closure of a story. A recent experimental study by Claudia Barriga and colleagues which tested how people best learn scientific facts from movies found that some viewers learn facts when they are framed as peripheral to the plot more effectively than when they are framed as central to the plot.<sup>33</sup> The superficial engagement with discourses of environmental crisis in the new series of *Doctor Who* may do more to remind viewers about the problems we face than do the didactic stories of earlier eras, to which people might close their ears. Granted, facts are not values, so this evidence grants tenuous support to the argument. But it is also possible that ideology disguised as entertainment is more persuasive than undisguised didactic preaching; certainly people are less likely to trust an infor-

mation source on science-related risk issues if they perceive the taint of vested interests.<sup>34</sup> Climate change has become a part of the cultural landscape in addition to being “an issue,” so it may be more appropriate to read new series of *Doctor Who* as normalising climate change discourse, rather than as deliberately ignoring it.

Finally, while it is easy to criticise a story like *The Poison Sky* for resolving its problems via the intervention of an omnipotent alien saviour, perhaps this fantastical approach is actually a mental health necessity for viewers. Newspaper columnist Michael Ruffles has made the point that viewers are constantly confronted with real-life climate change and other horrors, while the Doctor makes everything okay; he claims this is the reason *Doctor Who* is so popular with children.<sup>35</sup> Indeed, the onslaught of climate change-related bleakness has made a quarter of Australian children “so troubled about the state of the world that they honestly believe it will come to an end before they get older.”<sup>36</sup> It may be that the brief reprieve of *Doctor Who*, in which we experience the emotions associated with light at the end of the tunnel, is exactly what we need to survive.

*The Australian National University*  
lindy.orthia@anu.edu.au

#### NOTES

<sup>1</sup> Verity Lambert [prod.], *Doctor Who* [Television series] (1963, UK); Phil Collinson [prod.], *Doctor Who* [Television series] (2005, UK). For cast and crew of the *Doctor Who* serials discussed, consult BBC, “Episode Guide”, *BBC - Doctor Who - Classic Series*, 2010, date of access: 3 November 2010, <<http://www.bbc.co.uk/doctorwho/classic/episodeguide/index.shtml>>; and IMDB, “‘Doctor Who’ (2005)”, *Internet Movie Database*, 2010, date of access: 3 November 2010, <<http://www.imdb.com/title/tt0436992/>>.

<sup>2</sup> Stephen R Hulse and Laurence Marcus, “The Origin of Doctor Who: A Teletronic Article”, *Teletronic*, 2009, date of access: 3 November 2010, <<http://www.teletronic.co.uk/who1.htm>>; John Tulloch and Manuel Alvarado, *Doctor Who: The Unfolding Text* (London: Macmillan Press, 1983), 39-45.

<sup>3</sup> Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962).

<sup>4</sup> David J Howe and Stephen James Walker, *Doctor Who: The Television Companion*, 1st ed. (London: BBC Books, 1998); David J Howe and Stephen James Walker, *The Television Companion: The Unofficial and Unauthorised Guide to Doctor Who*, 2nd ed. (Surrey: Telos Publishing, 2003); Shannon Sullivan, “Planet of Giants”, *A Brief History of Time (Travel)*, 4 April 2005, date of access: 3 November 2010, <<http://www.shannonsullivan.com/drwho/serials/j.html>>. See BBC,

- “Classic Episode Guide” for reproductions of Howe and Walker’s commentaries on specific episodes: this is the source I use.
- <sup>5</sup> William M Tsutsui, “Looking Straight at Them! Understanding the Big Bug Movies of the 1950s”, *Environmental History* 12, (2007), 246-50.
- <sup>6</sup> Tsutsui, “Looking straight at *Them!*”, 249-50.
- <sup>7</sup> Roslynn Haynes, “From Alchemy to Artificial Intelligence: Stereotypes of the Scientist in Western Literature”, *Public Understanding of Science* 12, (2003), 252-3.
- <sup>8</sup> Tsutsui, “Looking straight at *Them!*”, 249.
- <sup>9</sup> For example, see Helmut E Landsberg, “Man-Made Climatic Changes”, *Science* 170, (1970) 1265-72. For an overview and bibliography on the history of scientific global warming research, see Spencer Weart, “The Carbon Dioxide Greenhouse Effect”, *The Discovery of Global Warming - A History*, 2010, date of access: 3 November 2010, <<http://www.aip.org/history/climate/co2.htm>>. BW Clapp notes that British scientists in the 1950s were “looking forward glumly to a new ice age” and that “The greenhouse effect did not impinge on [British] politics for another thirty years and more”; BW Clapp, *An Environmental History of Britain since the Industrial Revolution* (London: Longman, 1994), 49-50.
- <sup>10</sup> Paul R Ehrlich, *The Population Bomb* (New York: Ballantine Books, 1968), 61.
- <sup>11</sup> Howe and Walker in BBC, “Classic Episode Guide” *The Ice Warriors*.
- <sup>12</sup> Shannon Sullivan, “The Ice Warriors”, *A Brief History of Time (Travel)*, 8 November 2009, date of access: 3 November 2010, <<http://www.shannonsullivan.com/drwho/serials/oo.html>>
- <sup>13</sup> Immanuel Kant, *An Answer to the Question: “What Is Enlightenment?”*, 1784, date of access: 3 November 2010, <<http://www.english.upenn.edu/~mgamer/Etexts/kant.html>>.
- <sup>14</sup> Lindy A Orthia, “‘Sociopathic Abscess’ or ‘Yawning Chasm’? The Absent Post-colonial Transition in *Doctor Who*”, *Journal of Commonwealth Literature* 45, (2010), 211-12.
- <sup>15</sup> Raymond Williams, *The Country and the City* (London: Chatto and Windus, 1973). The quote is from Rachel A Morgain, “Beyond ‘Individualism’: Personhood and Transformation in the Reclaiming Pagan Community of San Francisco” (PhD Thesis, The Australian National University, 2010) 228, discussing a contemporary pagan community which has roots in “back-to-the-land” movements.
- <sup>16</sup> Nick Cullather, “Miracles of Modernization: the Green Revolution and the Apotheosis of Technology,” *Diplomatic History* 28, (2004), 227-254.
- <sup>17</sup> John Fiske, “Popularity and Ideology: A Structuralist Reading of *Dr. Who*” in *Interpreting Television: Current Research Perspectives*, ed Willard D Rowland, Jr and Bruce Watkins (Beverly Hills: Sage Publications, 1984), 173.
- <sup>18</sup> See Cullather, “Miracles of modernization”, 227-254, for a discussion of imperialistic politics and the Green Revolution.
- <sup>19</sup> Lindy A Orthia, “Antirationalist Critique or Fifth Column of Scientism? Challenges from *Doctor Who* to the Mad Scientist Trope”, *Public Understanding of Science* doi:10.1177/0963662509355899, (in press).

- <sup>20</sup> Alec Charles, "The flight from history: from H G Wells to *Doctor Who* - and back again", *Colloquy* 17, (2009), 26.
- <sup>21</sup> Clapp, *Environmental History of Britain*, 88.
- <sup>22</sup> Gary Werskey, "The Marxist Critique of Capitalist Science: A History in Three Movements?", *Science as Culture* 16, (2007), 417.
- <sup>23</sup> David Edgerton, "Science and the Nation: Towards New Histories of Twentieth-Century Britain", *Historical Research* 78, (2005), 106.
- <sup>24</sup> Edgerton, "Science and the nation", 107-8.
- <sup>25</sup> Robert Jones, "'Why Can't You Scientists Leave Things Alone?' Science Questioned in British Films of the Post-War Period (1945-1970)", *Public Understanding of Science* 10, (2001), 365.
- <sup>26</sup> Tulloch and Alvarado, *The Unfolding Text* 247-303; Alec Charles, "The Ideology of Anachronism: Television, History and the Nature of Time" in *Time and Relative Dissertations in Space: Critical Perspectives on Doctor Who*, ed David Butler (Manchester: Manchester University Press, 2007), 108-22.
- <sup>27</sup> I have argued in "'Sociopathic abscess' or 'yawning chasm'", 210-12, that in *Kinda* and other serials dealing with colonialism the colonised peoples must prove their worthiness for self-determination by demonstrating that they possess Western-style science. In this respect, the *Kinda* may be considered compatible with Western epistemological preferences, but in their social organisation, values, and spirituality they differentiate themselves markedly from Westerners, calling them "the not we."
- <sup>28</sup> Hugh Ruppersberg, "The Alien Messiah" in *Alien Zone: Cultural Theory and Contemporary Science Fiction Cinema*, ed Annette Kuhn (London: Verso, 1990), 32-38.
- <sup>29</sup> Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis. Summary for Policymakers* (Geneva: IPCC, 2007).
- <sup>30</sup> See also James Chapman, *Inside the TARDIS* (London: I.B.Tauris, 2006), 89-91.
- <sup>31</sup> Fiske, "Popularity and ideology", 165-98.
- <sup>32</sup> Joan Haran, Mwenya Chimba, Grace Reid, and Jenny Kitzinger, *Screening Women in Set: How Women in Science, Engineering and Technology Are Represented in Films and on Television (Research Report Series for UKRC No.3)* (Bradford: UK Resource Centre for Women in Science, Engineering & Technology, 2008), 6-7, 16-34.
- <sup>33</sup> Claudia A Barriga, Michael A Shapiro, and Marissa L Fernandez, "Science Information in Fictional Movies: Effects of Context and Gender", *Science Communication* 32, (2010), 3-24.
- <sup>34</sup> Lynn J Frewer, Chaya Howard, Duncan Hedderley, and Richard Shepherd, "Reactions to Information About Genetic Engineering: Impact of Source Characteristics, Perceived Personal Relevance, and Persuasiveness", *Public Understanding of Science* 8 (1999), 35-50.
- <sup>35</sup> Michael Ruffles, "The Doctor is a kids' favourite", *The Canberra Times* (24 August 2008), 26.



<sup>36</sup> Joe Tucci, Janise Mitchell, and Chris Goddard, *Children's fears, hopes and heroes: Modern childhood in Australia* (Ringwood: Australian Childhood Foundation, 2007), 7.