



HAL
open science

Television wildlife programming as a source of popular scientific information: a case study of evolution

Robert Dingwall, Meryl Aldridge

► **To cite this version:**

Robert Dingwall, Meryl Aldridge. Television wildlife programming as a source of popular scientific information: a case study of evolution. *Public Understanding of Science*, 2006, 15 (2), pp.131-152. 10.1177/0963662506060588 . hal-00571087

HAL Id: hal-00571087

<https://hal.science/hal-00571087>

Submitted on 1 Mar 2011

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Television wildlife programming as a source of popular scientific information: a case study of evolution

Robert Dingwall and Meryl Aldridge

The wildlife television documentary is an important but problematic genre, located between education and entertainment. Noting that the genre has characteristics that may increase its impact on the audience, this paper reviews its potential significance for science communication through a case study of the presentation of issues relating to evolution. First, the continuing popular and political support for creationism is examined, and then the new movement in support of Intelligent Design Creationism outlined. Based on an extensive sample of internationally produced programs, the research findings discussed in the paper focus on two dominant sub-genres: “blue chip” and “presenter-led.” While the former has higher production values and asserts greater authority, the pressures for a strong narrative discourage explorations of the contingency and amorality of evolution. The outcome is, typically, a text that does not challenge creationist accounts and may even implicitly endorse them. Paradoxically, we argue, although the presenter-led format is regarded as lower status within the media industry, it may offer more opportunities for conveying the complexity that is associated with evolutionary accounts. The authors conclude that the market context of television wildlife programming means that educational and entertainment aims and claims are indeed in tension, but with a counter-intuitive outcome.

1. Introduction

Scholars of science communication broadly agree on the limitations of the “deficit model”: the assumption that differences in understanding between experts and the lay public result from the latter’s ignorance of science (Gross, 1994; Wynne, 1995; Gregory and Miller, 1998). As Wynne (1992) demonstrated, in his work on Cumbrian sheep farmers dealing with the aftermath of the release of radioactive material from Chernobyl, scientific expertise is only one component in a matrix of personal experience and knowledge. While Miller (2001) and Collins and Evans (2002, 2003) have criticized simplistic uses of Wynne’s findings to claim that there is no difference in substance between expert and lay knowledge, significant

impetus has, nevertheless, been given to attempts to understand the bases of public responses to science. There is now a considerable literature on potential sources of scientific information. Several authors have dealt with the coverage of science in newspapers and magazines (e.g. Hilgartner, 1990; Dearing, 1995; Lewenstein, 1995; Long, 1995; Petersen, 1999; Condit et al., 2001; Conrad, 2001; Nerlich et al., 2002). A smaller number of studies have examined science coverage in broadcast media (e.g. de Cheveigné and Véron, 1996; LaFollette, 2002a, 2002b). In practice, however, much of this work focuses narrowly on content that is explicitly labeled as factual and science-related at the point of consumption.¹ More recently, there has been some interest in the study of science fiction, in various media, and the imagery of science that it contains (e.g. Turney, 1998; Kirby, 2003; Locke, 2005). As Nerlich et al. (2003) have noted, fiction is an important source of “social precognition,” the extent to which scientific innovations are anticipated by creative artists whose work then provides a frame for popular responses. However, little attention yet seems to have been given to an important genre that is positioned neither as pure fiction nor as science broadcasting, namely the wildlife or nature documentary.

This paper seeks to remedy that neglect. First, we introduce the wildlife documentary as a genre and establish its problematic location between production for entertainment and production for education or enlightenment. We then consider the genre’s treatment of a contested issue at the heart of the relationship between science and society: the Darwinian understanding of evolution. Next, we examine the implicit and explicit references to evolutionary processes in a sample of television texts, constructed to illustrate a range of program formats. Some formats are defined as more authoritative than others: is there a direct relationship between prestige and the scientific sophistication of their content? We argue that there is not and, finally, consider how the intersection of the twin demands to entertain and to inform impact upon the textualization and thus the way the scientific content is framed.

2. Wildlife television: its global significance

Wildlife programming is a major part of the international media industry. Reliable data are hard to derive from public sources but some indication of the industry’s scale can be established from corporate websites. Discovery Communications claim that their Animal Planet channel is available in 87 million US homes and another 150 million in 160 other countries (<http://corporate.discovery.com/brands/animalplanet.html>).² The National Geographic channel broadcasts in 27 languages to 230 million households in 153 countries (www.nationalgeographic.com/channel/intl/). One major series, the BBC’s *The Blue Planet*, was sold to over 40 countries within a few months of its release (BBC Worldwide, 2002). All of these figures relate to the reach of the programming: its potential rather than its actual audience. They do not, of course, provide any evidence on whether members of the audience situate themselves primarily as being entertained or as being informed—or indeed both at once. Nevertheless, wildlife programming is clearly a globally significant source of information available to the public about issues in biological and environmental sciences.

Although wildlife programming is often described as a documentary form, the academic study of film and television does not usually treat it as such. Grant and Sloniowski’s (1998: 11) collection of 27 essays on documentary film and video, which aspires to represent “the discipline of film studies . . . as it has developed over the last 25 years” makes no mention of wildlife. The topic is similarly absent from the authoritative studies by Winston (1995)

and Corner (1995). Bousé (2000: 94), one of the few media scholars to examine the genre, observes that, “it may be surprising to many outside the industry to learn just how many *inside* it regard wildlife films as primarily a storytelling form” (emphasis added). He is not, of course, suggesting that the content of wildlife films is any less “true” than that of mainstream documentary (tacitly defined by a focus on “social problems”).³ However, the representational conventions in the wildlife genre are based on the constructed “realism” of classic cinema (Bousé, 2000: 13), where the medium is “made to disappear” (Scott and White, 2003: 319, quoting Bolter and Grusin, 1999). From the earliest days of cinema, wildlife films competed directly with successful commercial fictions and adopted the same narrative forms. When television took over, the dominant US market continued to demand drama, suspense and happy endings: a “tyranny of formula” including plenty of “warmth and jeopardy” (Bousé, 2000: 81, quoting Stouffer, 1988). Animal Planet claims that it is “cable’s leading broad-based, family-friendly, entertainment network” (http://corporate.discovery.com/brands/us_networks/animal_planet.html).

In the UK, by contrast, there were, for a period, competing visions of natural history television—as adventures in natural history, vicarious days out at the zoo, and explicit science education (Davies, 2000). The founders of the BBC Natural History Unit in Bristol in 1957 saw themselves as defending the Corporation’s historic educational and cultural mission against the launch of commercial television. The BBC still uses its wildlife output as one of the main signifiers of its public service remit (Cottle, 2003; Wheatley, 2003). Its online mission statement to “inform, educate and entertain” carries a graphic depicting a police officer monitoring a demonstration (information), two popular comedians (entertainment) and a full-face picture of a tiger (education) (<http://www.bbc.co.uk/info/purpose/>).

In this field, however, cultural authority enhances the commercial value of entertainment. Discovery Communications’ Chief Operating Officer, Judith McHale, in a speech to the CTAM (Cable and Telecommunications Association for Marketing) Digital Conference (7 March 2002) posted on the corporate website, outlines their strategy, as a relative newcomer, to build trust in Discovery brands in order to compete in an environment of on-demand programming. The strategy’s implementation is demonstrated in the company’s press releases. These herald partnerships with UNESCO, with major corporations like Microsoft, and with leading primate researcher Jane Goodall (formerly signed to National Geographic), linking Discovery channels with global sources of cultural, economic and intellectual prestige. Respected individual presenters have also become global brands,⁴ adding their luster to the corporation: Sir David Attenborough’s involvement in programs such as *The Blue Planet* and *The Life of Mammals* is given equal prominence on both BBC and Discovery Channel websites, for instance.

This strategy appears to be effective: a Discovery Communications press release (8 April 2003) celebrates the performance of Animal Planet in a survey of US cable viewers. A comparison of 37 basic cable channels and four broadcast networks ranked the channel first for entertainment and for distinctive programming and fifth for quality and for information. A more recent press release (22 June 2004) reports a Harris Interactive survey that rates Animal Planet 12th among Media Brands and 10th among Television Brands in audience perceptions of overall quality. In general, however, relatively little is known about audience responses specific to this genre. There are, though, reasonable grounds for thinking that these may be significant.

The impact of media content on audiences has been fiercely debated since communications technologies aimed at a mass audience first developed at the end of the nineteenth

century. Psychology and political science initially led the field, but in the 1970s sociology and cultural studies joined the contestation. Early work tended to stress the determining force of content on audience (e.g. Glasgow University Media Group, 1976; Hall et al., 1978; McRobbie, 1991). This was quickly succeeded by a more nuanced acknowledgement of the “negotiated” nature of the interaction between text and audience (e.g. Hall, 1980; Morley, 1986). During the 1980s an essentially consumerist characterization of texts as polysemic and the audience as “active” in its choice and use of them was ascendant (e.g. Radway, 1984; Geraghty, 1991; Hermes, 1995). Since the early 1990s, however, the debate within sociology and cultural studies has reflected an increasing acceptance that, while not determining public opinion on social issues, media are potentially influential in affecting how users think about those issues (e.g. Miller and Philo, 1999)—an interpretation which has many elements in common with the extensive work on “agenda setting” in political science (e.g. Iyengar, 1991; McCombs and Shaw, 1993; Rogers, Hart and Dearing, 1997). There has also been renewed interest in understanding the ways in which the “institutional . . . structures of funding, policy, production and distribution” (Corner et al., 1990: 105) provide a context in which content is generated, and in considering what may increase, or decrease, that content’s impact. To the extent that these debates have reached any general conclusions, it is that messages from an authoritative or respected source, with whom the receiver has a long-term/preexisting relationship, and which is close or attractive will tend to increase impact, as will messages which are repeated, consistent, lack alternatives and are (at least apparently) concrete and unambiguous (McQuail, 2000: 431, quoting Treneman, 1967; see also McQuail, 2003). All of these features seem relevant to wildlife programming: the sources are authoritative and respected and appear to enjoy a high degree of viewer loyalty. Provided that the messages are consistent, then they may be expected to have impact.⁵

In considering the resources available to lay people in forming an understanding of biological and environmental issues, it seems clear that the study of wildlife and nature programming should play a central part. As this section has established, this is a large-scale enterprise, delivering factual material through the forms of entertainment but in ways that seem likely to have significant effects on viewers, according to the broad consensus of the general audience research literature. Given this, it is important to ask what resources are being made available and to consider their implications for the ability of viewers effectively to engage with scientific developments.

3. Why evolution?

Initial analyses of the dataset described below suggested that the narration of wildlife programs contained an unexpectedly large number of teleological (purposive or goal-directed) elements in contexts relating to the evolution, or evolutionary behavior, of the animals being described or depicted. Evolution is a particular area of contest between scientists and lay people, especially in the United States, so that the approach adopted by a widely consumed popular medium might have considerable implications for the outcome.

Over the past 30 years, a substantial body of scholarship has examined the debates between creationists and evolutionists (Park, 2001). This work is mostly American, reflecting the historical and contemporary prominence of this contest, particularly through a succession of struggles for control of school curricula, mainly in the Southern States.

Although the evolutionists were thought to have won a moral victory in the 1925 trial of schoolteacher John Scopes (*Tennessee v. Scopes*), the defendant was convicted and the Tennessee statute prohibiting the teaching of evolution was not repealed until 1967. Similar laws were passed in Arkansas and Mississippi and the topic of evolution was omitted from most 1930s high school biology textbooks (Nelkin, 1976, quoted in Barker, 1985). Each state and community reached its own accommodation between biblical literalism and evolutionary thought until the perceived challenge of Soviet technology in the late 1950s provoked national elites to press for the modernization of science education. This revived old conflicts, leading eventually to a Supreme Court ruling (*Epperson v. Arkansas*, 393 U.S. 97 (1968)) that state bans on the teaching of evolution violated the First Amendment, requiring neutrality in matters of religion (Nelkin, 1982).⁶

The continuing influence of creationism can be seen in US surveys, which show that Americans are more skeptical about evolutionary thinking than almost any other nation. Reviewing Gallup poll data from 1982 until 1997, Bishop (1998) notes the consistent finding that about 45 percent of respondents stated that they believed in the literal truth of Genesis, about 40 percent believed in a theistic account,⁷ where God guided the evolutionary process, and only about 10 percent accepted the Darwinian orthodoxy. Comparable questions asked in the International Social Survey Program (ISSP), covering 21 developed nations, demonstrate that American adults were the least likely to accept evolution. ISSP data from 1993 show 45 percent of American respondents agreeing that human beings were descended from earlier species of animals compared with 74 percent of UK respondents (Gendall et al., 1995). *US Science and Technology Indicators 2002* noted that its 2000 public understanding survey was the first occasion when more than half of all respondents had agreed with this statement (<http://www.nsf.gov/statistics/seind02/>). More recently, however, a Harris poll of June 2005, cited in *Time* magazine (15 August 2005), found an increase since 1994 in the proportion of respondents who did not believe that humans had developed from an earlier species, from 45 percent to 54 percent.

The main political strategy of creationists now focuses on undercutting the authority of the Darwinian account of evolution. Two main techniques are used. One involves promoting evolutionary and creationist accounts as rival hypotheses of equal standing deserving equal curriculum time (Park, 2001). A number of US states, including Louisiana (1981), have legislated on this basis, although it has also run into First Amendment problems (*Edwards, Governor of Louisiana, et al. v. Aguillard et al.*, 482 U.S. 578; 107 S. Ct. 2573 (1987)). US President George W. Bush endorsed this line of argument in an interview with Texan reporters on 1 August 2005, and it was supported by 55 percent of respondents to the June 2005 Harris poll cited above. The other technique is to seek influence over the adoption of biology textbooks in public schools.⁸ In 1999, Kansas creationists persuaded their State Board of Education to proscribe textbooks that taught evolution and related topics, such as the geologic timescale. This decision was reversed following new elections in 2001, but anti-evolutionists secured a majority again in fall 2004 and are seeking to restore the proscription. Since 1996, Alabama has required all public school biology texts to carry a sticker noting the speculative nature of evolutionism. There has also been a move to more localized activism: in March 2002, for example, the School Board in Cobb County, an Atlanta suburb, decided to add stickers to its new biology textbooks; from September 2002 science teachers were required to discuss critiques of evolutionary thought. Litigation about this decision was still in the Federal Courts in the spring of 2005.⁹

This shift in political strategy has been accompanied by a shift in intellectual strategy. Intelligent Design Creationism (IDC) is increasingly displacing biblical literalism. IDC

revives the arguments of William Paley (1743–1805), whose *Natural Theology* (published 1802) was the principal target of Darwin's generation (Le Mahieu, 1976). Paley argued that the evidence of design in the universe implied the existence of a designer. If we had never previously seen a watch but found one lying on the ground, we would necessarily infer that its parts had been framed and put together for a purpose. In the same way, the intricacy and complexity of the universe, exemplified in structures like the human eye, demonstrates the artful intervention of God.

Forrest (2001) outlines the re-emergence of IDC in the work of a group clustered around the Center for Science and Culture at the Discovery Institute in Seattle (www.discovery.org). Conservative Christian interests have funded the Center's work as part of a long-term strategy to develop a theistic alternative to contemporary science. The key players—Philip Johnson (1991), a law professor, Michael Behe (1996), an academic biochemist, and William Dembski (1998, 1999), a mathematician and philosopher—form the core of a relatively small but tight network, as evidenced through the mutual citations and acknowledgements in the cited texts, and in their contributions to each other's edited collections. Although their choice of examples is wider and draws on contemporary biology and mathematics, the core of the argument remains the same as in Paley's time: the probability that human beings, and the environment to which they are uniquely fitted, could evolve by random and contingent processes is so small that it is more plausible to assume that the process was, and is, designed and planned to achieve this goal. The proof of Creation lies not in the story of Genesis but in the overwhelming complexity of the natural world.

The UK presents a very different picture. Only 7 percent of British respondents to ISSP surveys believe that the Bible is the literal word of God, compared with 34 percent of Americans (Bishop, 1999). State regulation of religious education in public schools has historically blocked the teaching of Christian fundamentalism, although Barker (1985) estimated that there were several hundred thousand adherents to minority churches that espoused biblical literalism. She presented UK creationism as a movement in decline, a conclusion more recently endorsed by Locke (1994). However, UK government encouragement of faith-based schooling is altering this situation. In spring 2002, there was controversy over the revelation that a state-funded school, Emmanuel College, in Gateshead, was teaching National Curriculum science in a creationist context designed to undermine its evolutionary elements. The school's promoters, the Christian Institute, founded in 1991 to promote fundamentalist beliefs within the Anglican Church, are working with a multi-millionaire car dealer to set up a chain of such schools. A second opened in Middlesbrough in the autumn of 2003 and a third will open in Doncaster during 2005 (<http://www.emmanuelctc.org.uk>). The offer of significant funds to poor cities in economically depressed areas of the North East of England has persuaded their local governments to accept the curricular compromises involved without raising concerns in national government. Two similar projects are reported to be under way in the West Midlands with support from another "born-again" car dealer (*The Observer*, 7 August 2005).

To the extent that the initial observations about the teleological narration of wildlife programming were sustained, this source of public information, which, as we have noted above, is likely to have a substantial influence on its audience, is adopting a particular position on issues that are hotly contested between scientists and sections of the public. Even if programs are not explicitly advancing an IDC account of evolution, they might fail to offer audiences access to the Darwinian version dominant in the biological and environmental science communities.

4. Defining a sample

Our sample of wildlife programming was collected from UK terrestrial, satellite and cable broadcasting during October and November 2001. Although the sample is confined to material broadcast to the UK, most of the specialist non-terrestrial channels are shared with the US, while both the BBC and Channel 4 normally sell on their most prestigious material to American stations. The autumn is a period of particularly high-profile activity in this respect, comparable to the “sweeps” in US television where ratings and rankings are established for a season. In 2001, the BBC launched *The Blue Planet* and *Walking With Beasts*, while Channel 4 replied with *Extinct*. (In autumn 2002 the BBC pursued the same strategy with *The Life of Mammals*, which reached the US during the May 2003 sweeps.)

Because of the abundance of material, an initial decision was made to exclude programs on the following topics: domestic animals; human biology or anthropology; gardening; farming; wildlife conservation (that is, focused on policies rather than flora and fauna); cryptozoology (“mythical beasts”); and programs aimed explicitly at children. Even with these exclusions, the volume of output and the repetitive nature of scheduling on the satellite/cable channels meant that a sampling strategy was required. Recordings were made on the following basis: radio—all output; terrestrial television (analog) channels—all output; the selected cable and satellite channels (National Geographic, UK Horizons, Discovery, Animal Planet)—on a rolling basis: Discovery on Monday in week 1, Animal Planet on Tuesday in week 1 then Discovery on Tuesday in week 2, Animal Planet on Wednesday in week 2 and so on. Over a period of seven weeks, programming from each day of the week on each channel was taped, giving a final set of 178 programs. All radio programs and a sub-sample of television programs were transcribed in full. The remaining programs were viewed and a summary prepared, together with transcriptions of selected passages that dealt, explicitly or implicitly, with evolutionary processes.

Wildlife programming is dominated by two sub-genres: “blue chip” (47/178 programs) and “presenter-led” (49/178). Bousé defines blue chip (2000: 14–15) as dealing with mega-fauna; in an environment of visual splendor; using a dramatic storyline; and marked by the absences of politics, people or historical reference points. Presenter-led or “adventure” features expanded human presence; more human/animal interaction; dynamic editorial approaches; low costs; and quick turnaround (Bousé, 2000: 73). (A number of other sub-genres will not be discussed in detail here.¹⁰) Within the industry, the presenter-led sub-genre is regarded as a “cheap and cheerful” style, of lower creative status than blue chip with its high production values and conspicuous investment in science. This industry shorthand should not obscure the fact that blue chip programs can feature presenters, such as Sir David Attenborough, whose iconic presence contributes to their prestige. However, their narrations, whether on-screen or off, characteristically feature “one voice,” both literally and metaphorically, delivered in an authoritative register and within a closed narrative structure.

Our analysis of program soundtracks had two components. One was a conventional inductive reading of the transcripts and the other was a systematic word-search for terms potentially implicative of IDC, including “design,” “plan,” “goal” and “strategy.” In itself, as we shall show, the occurrence of a word from this list does not indicate the presence of an IDC account. However, the combination of these methods allows us to claim that we have exhaustively considered a representative sample of UK broadcasting output for “evolution-related” talk. In this paper, we shall focus on the set of “design” usages. There are 29 of these in blue chip (18) and presenter-led (11) programs. Despite

the alleged differences between these sub-genres, it should immediately be noticeable that “design” usage occurs with some regularity in each.

5. Design talk in presenter-led programs

Within this sub-genre, there are a few occurrences of “design” as a noun in a relatively unelaborated way but teleological usages in verb form are more common. (In the quotes that follow, the terms under discussion have been emphasized by being marked in bold.)

You will actually notice that they have a mouthful of very, very sharp dagger-like teeth. And they’re actually **designed** for catching their prey and holding it while it struggles and swallowing it whole. (*Shark Gordon*, Animal Planet, 17 November 2001)

He’s a viper and as with most species of viper the venom is **designed** to both kill prey and to destroy the tissue of the prey to make the digestive process that much easier. (Jeff Corwin, Animal Planet, 1 November 2001)

Now when we let him go he could very well go right up a tree because he’s got this long tail and beautiful long claws. He’s really **designed** for climbing. (*The Crocodile Hunter*, Discovery, 8 October 2001)

While none of these extracts *necessarily* implies a Designer, they would need to be heard with quite a sophisticated understanding of evolutionary thinking to avoid this interpretation. As we show below, in the “wolf and elk” extract, evolutionary narratives can use the word “design” but they locate it syntactically and semantically in quite different ways. These sentences all take a passive form—the agent of the design remains unspecified. At the same time, agency is clearly present—they have been designed for a purpose.

At other points the idea of a Designer comes closer to the surface of the text. The first example refers to the aesthetics of a bird species.

Set off with a scarlet eye not a bad bit of **design** eh? (*Oddie Goes Wild*, BBC2, 9 October 2001)

A great hammerhead in the water is absolutely breathtaking. They have to be one of my favorite sharks to see in the water because they’re just, their **design** it’s like bizarre, amazing and beautiful all at the same time. (*Aquanauts*, Animal Planet, 16 November 2001)

Evolution is indifferent to aesthetics. Its results may be visually pleasing to us but that is our judgment on a process of selection driven by reproductive advantage conferred by the fitness of adaptation to a particular environment. We may intervene, as we have with domesticated species of animals and plants, to impose our taste, but it is then we who are acting as designers. However, aesthetics seems to be a particular point at which IDC-like language appears.

It reminded me that the Adelaide penguins are perfectly **designed** for their life in the freezer. (*Nik Baker’s Penguins*, BBC2, 25 November 2001)

This is a tiger shark tooth and it’s **designed** to cut through that shell like a can opener. (*Shark Gordon*, Animal Planet, 25 November 2001)

The first of these extends the argument about aesthetics to the whole of the penguins’ being. It echoes Paley’s account of the perfection of the watch and its workings and invites us to

infer an agent who matched the penguins to their environment. The second compares the shark's tooth to a can opener, an object undeniably designed by a maker.

6. Design talk in blue chip programs

Blue chip programs are often assumed to represent the most scientifically authorized form of wildlife programming but their "design" usages do not differ greatly from those of the presenter-led sub-genre. The following examples are typical.

Now the killifish shows its true colors, superbly **designed** to flit from stream to stream in this temporary water world. (*Wild Africa*, BBC1, 21 November 2001)

The real key to a goat's acrobatics are its hooves. They are **designed** to hook onto the slightest outcrop. (*Goats*, Animal Planet, 16 November 2001)

Monkeys, perfectly **designed** to travel from tree to tree, they travel the rainforest canopy. (*Wild Africa*, BBC1, 21 November 2001)

There is only one clear example in our whole dataset of an approach that is faithful to contemporary evolutionary thinking.

The presence of the wolf has shaped the elk. In size, speed, grace, all the way down to her sharp, lightning quick hooves, she owes much of her streamlined **design** to the wolf's pursuit through the ages. (*The Wolf's Return*, UK Horizons, 26 October 2001)

What makes this extract different is the way in which the elk's design is said to arise out of the interaction with her main predator. Elks without the same size, speed, grace and flashing hooves have been selectively eliminated. A fully Darwinian account would need to acknowledge the way in which the elk has also shaped the wolf—those who are not quick enough in pursuit or agile enough to escape the hooves have also been eliminated. Each party is the agent of the other's design: no other agency is involved or implied.

However, extracts like this must be balanced against others that lean towards implying a designer.

Under water, incoming tides can create a strong current and flounders are experts at hitching a tidal lift. They're shaped rather like a kite, a **perfect design** for gliding on the tide. (*The Blue Planet*, BBC1, 24 October 2001)

Chameleons may not be adapted to life in water but hippos most certainly are. Ears, eyes and nostrils are all **perfectly designed** for endless days of bathing in the African sun. (*Zambezi*, National Geographic, 2 November 2001)

The bright purple blossoms of *Laperusia* are **designed** purely to attract a fly with the longest tongue in Africa. As the fly probes for a sip of nectar in the long floral tubes pollen is dabbed onto its forehead. A smart **design** but on a windy day it's not so easy to hit the target. (*Wild Africa*, BBC1, 21 November 2001)

As in the earlier example, the notion of perfection is introduced, with the last extract actually raising the issue of intelligence or "smartness." The third occurrence may also usefully be contrasted with the language used to describe the elk and the wolf. The blossoms and the fly have not designed each other: the blossoms have been designed—by whom or what?—to attract a fly with a long tongue.

Despite the assumed superiority of the blue chip sub-genre, there is, then, relatively little difference between this and the supposedly more populist presenter-led sub-genre in

their treatment of evolutionary issues. The only sub-genre where more explicitly Darwinian accounts can consistently be found is the “extinct” type. These programs tend to share the same production values as the blue chip type but evolution is central to their theme and tends to be more carefully dealt with in the script. However, even here, the narration often wobbles. The following examples are all from *Extinct*, Channel 4, 2 October 2003.

The saber-tooth is often thought of simply as a lion with big teeth but it’s a very different animal. She’s twice as heavy as a modern lion—built more like a bear with stocky muscular shoulders, shortened hind legs and a stunted tail. All **designed** to deliver power to her killer canines.

For the saber-tooth the proliferation of bison means hard times. Despite the fact she’s beautifully **designed** as an ambush predator she’s becoming peculiarly vulnerable. In dryer more open country there’s less cover and she’ll struggle to hunt using her highly **evolved** ambush skills. She’ll need to chase down her prey but she simply isn’t built for speed.

Despite being beautifully **designed** to pounce and kill now everything is working against her. In bigger groups the bison spot danger more easily across the open land. They’ve seen her coming and can easily outrun her. Superb **adaptation** to an Ice Age land environment didn’t help the female saber-tooth once that environment changed.

The same features are associated with “design” in these extracts—passive constructions, aesthetic references, and metaphors of human construction (“built . . . like”). Here they coexist with more explicitly Darwinian references to “evolved . . . skills” and “adaptation” but they do not displace them.

These data demonstrate that viewers of UK-produced television wildlife programming are highly unlikely to be confronted with narration that explicitly and unequivocally reflects the Darwinian account of evolution. This is not to say that the programming makes direct use of either IDC or theistic evolutionary accounts, nor that the extracts can *only* be heard in the way that we propose: it is simply that, at crucial points, there is an ellipsis allowing viewers to hear the narration without disrupting whatever prior framing they have brought to their viewing. Given the fact that most of these programs will also be seen by US, and, indeed, worldwide Anglophone audiences, this is a conclusion of more than local significance.

7. Explaining the narration

If blue chip programming is supposed to have a higher degree of scientific authorization, why do its narrations often resemble those of the supposedly inferior presenter-led sub-genre? Why do they not challenge the creationist viewer to confront the scientific worldview that lies behind them? To answer these questions, we need to take account of both the material conditions under which these programs are produced and the basic representational conventions of the sub-genre.

The economics of wildlife programming are a strong constraint on the possibilities of production. The blue chip and extinct sub-genres are essentially in competition with cinema: *Jurassic Park* and its sequels redefined the production values for anything using animation, for example.¹¹ There are also competitive pressures to seek ever more difficult and spectacular locations (deeper, colder, higher, smaller . . . etc.) that are still inaccessible to all but the wealthiest viewers.¹² Making a blue chip program has become a very expensive operation. This has provoked three responses. One is production for a worldwide market:

It was a proud boast of *Survival* that its programmes have been shown “in every country in the world with a TV transmitter”. Because they didn’t have presenters, the scripts could be redubbed into any language. At one stage in Hong Kong, the Chinese script was read live as the pictures were broadcast. But that flexibility has also contributed to *Survival*’s downfall. Film-makers in Germany, Japan and Scandinavia have been making films that can be redubbed into English to take advantage of the American market. (*The Guardian*, 12 February 2002)

A second is co-production: in our sample *The Gene Hunters*, a UK/Canadian production broadcast on National Geographic on 26 November 2001, lists its producers as Café Productions Ltd (London) and Cineflix Productions Inc. (Montreal) in association with Dedeon SA (presumably French or French Canadian), Südwestrundfunk (German)—and with financial support from the Government of Canada, the Province of Québec and the European Union. The third involves ensuring that the product has a long potential “shelf-life” by filming in ways that avoid contemporary images and references. This allows costs to be recovered over a long period of repeat sales, or sales into less affluent markets: “We recently sold a lot to Discovery Channel’s Animal Planet and . . . they have really stood the test of time . . . As long as there aren’t too many people in flares or old Ford Cortinas the films are fine—the wildlife behaved the same way 30 years ago as it does today and did 30,000 years ago” (*The Guardian*, 12 February 2002).

These constraints tend to encourage the production of programs with powerful visual images, which can be re-dubbed with soundtracks in different languages and even re-edited for different markets. To be potentially acceptable worldwide, they must also appear apolitical and have as few cultural references as possible. Moreover, the market-leading BBC and other UK-based producers have the elimination of controversy inscribed in their working practices by statute. (For the BBC see Editorial Guidelines <http://www.bbc.co.uk/guidelines/editorialguidelines/edguide/>; for other broadcasters <http://www.ofcom.org.uk/tv/ifi/codes/bcode/undue/#content>.)

The textualization of wildlife television is not, however, a simple matter of commercial determinism. This approach also coincides with the basic positivism of most natural science. The presenter “stands outside the film . . . The naturalist film-maker looks but, unlike the hunter or the zookeeper, does not touch, and the images produced are thus able to transcend the moment of recording, universalized as natural behaviour” (Davies, 2000: 451). In the same way, scientific reports transcend the circumstances of their production to produce purportedly universal accounts of the real (Latour and Woolgar, 1979). Ultimately, as Peter Scott, one of the pioneers in UK television, remarked, wildlife programming is the successor to the lantern slide lectures of Victorian scientific popularization (Davies, 2000: 449). The audience is confronted with images and told how to make sense of them through the presenter’s monologue.

This, in itself, would not account for the lack of explicitly Darwinian narrative frames, other than as a desire not to offend sections of the potential audience. The objective of making a globally accessible product may mean that the issue simply never arises. Several commentators have remarked on the way in which the structures of wildlife programming tend to draw on a small number of Grand, and presumptively Universal, Narratives (Coward, 1984; Wilson, 1992; Crowther, 1995; Bousé, 2000): life and death; the unchanging seasons; diurnal rhythms; the struggle for survival; the universality of family ties. This sequence about polar bears comes from *The Blue Planet: Frozen Seas*, BBC1, 3 October 2001. The narration is all in voice over.¹³

- 1 In late March and into April female bears emerge from winter dens with their new cubs
Long shot of bears (Rear L)
- 2 The mother has not eaten for at least five months and she's hungry, very hungry (0.3)
Close-up of M (L)
- 3 (0.6) If she doesn't succeed in catching a regular supply of seals her milk will fail
Mid-shot of M and cub—blurry (L)
- 4 and her cub will die
Close-up of cub (R)
- 5 (0.5)
Close-up of M and cub
- 6 (0.2) Bears have an extraordinary sense of smell and can detect seal pups hidden in the snow from 2 kilometres away
Close-up of M sniffing snow (R)
- 7 (1.2)
Close-up of cub (L) Close shot of M pounding on ice (L)
- 8 But a female ringed seal uses several lairs
Long shot of M (L)
- 9 and the bear will certainly have to break into a number before it finds one that is occupied (0.2)
Close-up of M (C)
- 10 (0.8) This is a crucial time for the cub
Cub digging (L)
- 11 by watching its mother hunt and by copying her actions
Cub (R)
- 12 it's beginning to acquire the rudiments of its own hunting skills (0.6)
Cub and M in mid-shot
- 13 Play is also important for developing muscles and improving
Cub and M in long shot (L)
- 14 coordination (2.1)
Cub and M in close-up (R)
- 15 As the days go by the sun rises higher and remains above the horizon even at night (0.2)
Shot of sun directly ahead over mountains
- 16 (0.8)
Bears in long shot—silhouetted [light much pinker]
- 17 (0.2) The female bear continues to hunt until her cub is too tired and can't keep up
Close-up of M in silhouette [same pinkish light]
- 18 (0.4)
Cub in close shot (R) [much whiter light]

- 19 She smells something (2.4)
M in close shot, pounding at snow (L) / brief close-up of seal / same shot of M / seal / M / cub / seal [louder music]
- 20 The pup escapes
Seal diving in hole
- 21 through a hole in its lair which leads to the sea below
Seal swimming under ice
- 22 (1.7)
M shaking off water (S)
- 23 (0.8) Only one in twenty hunts are successful but
Cub in close-up (S)
- 24 this mother must find a seal pup soon if her cub is not to starve to death
M in mid-shot (S)
- 25 (0.7)
M moves away in long shot (S)
- 26 (1.1)
Cub scampers after in same long shot (S)

The bears are not overtly anthropomorphized yet this is edited and narrated as the story of a single parent and her child, whose survival depends on the outcome of the hunt. Humanized actions and purposes are imputed to the bears. The narrator cannot know precisely what the female bear feels (line 2)—but after five months without food he would feel hungry. Similarly, he cannot know that the cub's tumbling has the same meaning as play to a human infant (lines 13–14)—but it looks similar and he feels confident in imputing this meaning. The viewer is told an emotive story, which is made even more moving by the indeterminacy of the ending: will these bears live or die?¹⁴ It is a highly constructed sequence. Most obviously, there is rapid dramatic cutting in parallel to the narration at line 19, accompanied by a crescendo in the music: the bear's attack on a suspected seal hole is followed by a quick shot of a seal, which we are invited to think of as cowering in its lair, then back to the bear, then to the seal, the bear, the cub and finally the seal diving and escaping. The quickness of the edit deceives the eye: these are not contemporaneously filmed images. This is not *the* seal presumed to be under attack but another seal filmed on another occasion. However, a careful viewing reveals that the artifice is more extensive. The letters in parentheses indicate the apparent direction of lighting, identifiable from shadows or highlights. As the sequence moves from shot to shot, the light direction varies, as does the picture quality and the color of the lighting. While one might expect cutting to condense real time to the space available, these variations strongly suggest that shots taken on different occasions have been selected to produce a visual storyline to accompany the narration.

In this context, there is little space for the systemic and contingent language of evolution. As Bousé (2000: 164) points out, the focus on the fate of individuals also introduces an illegitimate moral dimension. Evolution is indifferent to the fate of this female polar bear and her offspring, and, indeed, to the fate of *Ursa maritimus* in general, but the language of the commentary presses viewers to care (e.g. lines 4 and 24 which both refer to the potential death of the cub, alongside appealing close-ups of the small animal). None of this is to detract from the commitment and intentions of the filmmakers: Sir David Attenborough, for example, has remarked on how he became drawn into television by the

lack of opportunities in post-war British universities for studying behavioral ecology (Burgess and Unwin, 1984; Attenborough, 2002). However, the demand for a coherent and engaging story can slide into the imposition of a logical order rather than a contingent order on events. The logic of narrative may easily be confused with the logic of Design.

Given the pervasiveness of “celebrity culture” the presenters of blue chip programs have inevitably become a more prominent part of the package. Nevertheless, in this format they are commentators, standing outside the action and acting as a vehicle for the story. In the presenter-led format, however, the activities and emotions of the presenter *are* the story: they are at the center of the action. The organizing Grand Narrative is the quest for enlightenment with the presenter in the role of the medieval knight searching for the Grail while encountering various obstacles and potential guides, allies or opponents along the way. The audience joins the presenter on this journey. Ironically, this is acknowledged by Sir David Attenborough, in responding to a journalist inviting him to comment on press reactions to earlier and somewhat inaccurate, press coverage describing the present study, when he declared himself “bemused to hear that [Steve] Irwin’s programs [*The Crocodile Hunter*] can be seen as anything other than good adventure stories” (*Dominion Post TV Week*, 4 March 2003). Counter-intuitively, when the presenter becomes the story, rather than the wildlife, space is created for a more open narrative. The polar bear sequence above can, for example, be contrasted with the account of its origins given in *Making the Waves*, BBC1, 3 October 2001. This is from the “making of” sub-genre of programs, which adopt the same quest structure, based on the camera crew’s adventure in recording the material that went into the sequence: DA is Sir David Attenborough, while Doug and Jason are the crew.

Caption “Svalbard—Day 1”

DA: On the Arctic islands of Svalbard Doug Allen and polar expert Jason Roberts are in search of polar bears. They’re carrying everything they need to live up here for four weeks but almost straight away they run into a problem.

Doug: We’ve got what we call whiteout when the clouds have come over we’ve got no contrast. The next route lies out over the seas and we need good conditions for that because the series might not be too good so we’ve decided just to stop here at this snow covered in the hope that the weather gets better.

(. . .)

Caption “Svalbard Day 7”

DA: Near the shoreline in Svalbard the ice is constantly moving and polar bears come here to try and catch seals but to find a white bear in this white wilderness requires a great deal of persistence.

Doug: Eleven hours I feel as though these things have been glued to my eyeballs. One bear who was much too wary of us to allow us to get anywhere close. A long day for not very much.

(. . .)

Caption “Svalbard Day 12”

DA: Back in the Arctic the weather is still holding things up.

Doug: This is definitely not a day to go looking for bears. It’s about minus 15 lots of wind it’s so ferocious so I’m now going back in

(. . .)

DA: One of the advantages of working in the polar regions is that in the summer the sun never sets and you can work out on the ice right round the clock. Just as well for Doug and Jason who still haven't found their polar bear.

Jason: Freeze dried curry and chicken absolutely lovely at minus 20, mix it with a bit of water. Tastes like crap but you can live on it.

DA: Despite the food things did seem to be looking up. At long last after days of searching they had found a polar bear cub . . . and its mother. The light was ideal for filming but the bears were not being cooperative.

Doug: That was so frustrating. We had this female and a cub and we'd been kinda watching her for the last three four hours doing a bit hunting not very close and anyway she came into a nice position and then I took a few steps towards her and she was a long way away but she just completely reacted the wrong way and I lost all her confidence and just pissed off somewhere and it's such a nice day for filming and I thought we had it awhhh.

Caption "Svalbard Day 18"

DA: Despite the set backs two days later Doug's persistence finally paid off and he was able to win back the confidence of the bears.

Doug: . . . it's five o'clock in the morning and the 18th day of the shoot and I think we just cracked it. We had a female there with the cub and she did quite a lot of pouncing about at about 18 meters away just a nice sort of distance and you know what she did when she was finished she was so relaxed she sat down and gathered the cub into her and suckled her head on to the camera. The weight off your mind when you get something like that it's incredible . . .

The point here is less the fact that it has taken three frustrating weeks of hardship to generate the film than the way it underlines how the bear behavior presented in *Frozen Seas* has been filmed so that it can be edited to fit a prior narrative structure. An underwater camera operator on the same series makes the point more explicitly: ". . . from a purely professional point of view the sequence had to have an ending so to have this carcass floating in the water after the killer whales had taken their fill was quite a bonus" (*Nature*, BBC Radio 4, 15 October 2001). As Davies (2000: 452) notes, from the late 1950s, producers were deciding that they could no longer use sources interested in *taking* film of wildlife rather than *making* film of wildlife.

Where the Grand Narrative is the presenter's quest, the everyday reality of science as full of contingency, untidiness and unsolved problems can be much more easily accommodated. This is from *O'Shea's Dangerous Reptiles* (Channel 4, 1 October 2001)

I'm Mark O'Shea. I'm a zoologist. I specialize in reptiles. I'm in Australia the oldest land on earth, jammed pack with amazing creatures. I'm here in search of one of the least known snakes on the planet. I can't guarantee I'm going to find it because everything you'll see on this film is happening for real.

Leaving aside the question of what "happening for real" might mean, we can note that this opening establishes both the quest ("in search of . . . least known snakes") and the uncertainty of outcome ("I can't guarantee . . . to find it"). The hunt for the rough scaled python is difficult: there has been a severe flood in the site since a previous pair were caught.

O'Shea reflects in voice over on the reasoning processes involved in the search—notice the elements of mystery and uncertainty:

But if I was a python where would I be hiding. The snake at the center of our quest is here somewhere I'm sure of it. But after searching I'm developing my own theories about where to look. Perhaps it's hiding in the crevices that line the walls of the gorge. It's unseasonably cold and if I were a python that's where I'd be keeping out of the chilly night air. The natural history of this python is still largely a mystery. All the world's pythons have got smooth scales except this one. Its scales are keeled or rough. Why? Elsewhere keeled scales are associated with desert sand dwelling vipers or fresh water aquatic snakes like keelbacks. What purpose can they serve for this tree and rock dwelling python?

This python presents an evolutionary puzzle: why does it have a feature, “keeled scales,” which it does not share with other pythons? Although O'Shea uses the language of “purpose” at the end, he has led into this with a very neutral reference to an “association” between keeled scales and other snake species, which makes it easier to hear “purpose” as a synonym for “reproductive advantage” than for “design” or “intention.” The audience is shown the scientific thought process at work and invited to join in solving the puzzle of the rough scaled python: O'Shea does not lay down a definitive answer.

The following extract is from the end of the program—the italics mark where the presenter is speaking in voice over rather than direct to camera.

O'S: Day 9 comes and goes. Dave and I decide to take our rubber Zodiac through croc infested waters to search a neighboring gorge. But no rough scaled pythons. Then on day ten John Wigall strolls into camp with something in a snake bag.

O'S: You needed some Aussie magic.

JW: Mark O'Shea we just had to keep looking.

O'S: Searching alone he'd found a rough scaled python.

(...)

O'S: The film crew had been flown out. We were waiting for the chopper to return when Alf and I captured another rough scaled python. It turned out to be a male so John got his second pair after all.

The contingency is striking—the chance of the capture of the first python is underlined and there are no pictures of the other because it did not turn up until the film crew had left. This is life with rough edges, much as the camera crew described their hunt for the polar bear footage.

We should not, of course, fall into the error of thinking that one genre is necessarily more real than the other. Roughness and contingency are also fabrications arising from the editing decisions made by the program team to suit a different kind of organizing narrative. However, we should underline the implications of one strategy rather than another. The blue chip emphasis on order represents a world that is consistent with the language of Intelligent Design. The narration tells the audience how it is. Although the presenter-led formats use many of the same linguistic forms, these are recurrently undercut by reminders of the indeterminacy of nature. Pythons and polar bears do not enter on cue according to the script. As the O'Shea extracts show, the viewer can be brought into the puzzles of science and treated as a co-investigator rather than as a spectator. The presenter is working with a team, who are contributing in different ways and occasionally disagree. It is the difference between the lantern slide monologue and the interactive discovery center.

8. Conclusion

Wildlife and nature documentary programming has a very broad reach among television viewers, at least in the Anglophone world. Although we do not have direct evidence of audience responses, the genre has features that seem likely to enhance its impact and to make it an authoritative source of potential information for ordinary citizens about biological and environmental sciences. It therefore seems likely to have a crucial role to play in any research program that seeks to understand the bases of “social precognition,” the prior framing that lay people bring to scientific issues. We have, however, shown that the commercial and narrative imperatives of the genre may influence the representation of scientific issues in ways that increase rather than diminish the differences in understanding between lay people and biological scientists.

The most surprising and counter-intuitive finding, however, is the extent to which high-prestige, blue chip programs may actually be less effective than conventionally less highly regarded alternatives at conveying both the practice and the outcomes of science to mass audiences. For large media organizations, blue chip programming is a token of status and authority, emblematic of the claim to a social mission that transcends mere commercialism. Our analysis, however, suggests that it should be better understood as a spectacle. Its economic and cultural constraints limit its capacity adequately to communicate the complexities of science. The very production values that give blue chip programs their authority—the leading edge science; the underexplored locations; the respected presenters; the tenacity, endurance and expertise of the production team—impel the product towards textualizations that work against a proper sense of the uncertainties of scientific work. The costs of achieving these production values lead to a way of editing and narrating programs that maximizes their market potential, but lowers the profile of content that may challenge sections of the audience. Although presenter-led programs may confer less authority on a broadcaster and operate on lower budgets with more limited production values, they can be made in ways that are potentially more involving for viewers and, arguably, offer a greater opportunity for engagement with scientific understandings of the world. This is not, of course, to say that they necessarily do this, nor that they are never cheap, crass and exploitative; merely that their more open narrative form offers a wider range of possibilities for viewer engagement.

The treatment of evolution is a proxy for a wide range of concerns about the understanding of genetics and of environmental change. If the Darwinian approach is not clearly understood, for example, it is difficult to comprehend the issues around genetic modification of food crops or animal species or about the implications of environment/species interactions in response to global warming. The ambiguous treatment of evolution also creates space for advocates of alternative approaches, particularly Intelligent Design Creationists, to operate essentially unchallenged. Although IDC is an academically marginal social movement, its resources give it considerable societal weight in seeking to influence curricula in public schools in the US and, increasingly, in the UK. The consequences in the US are already conspicuous, with many high schools either omitting or marginalizing evolution from biology classes rather than face conflict or controversy. If authoritative broadcast media are not challenging this neglect in what would normally be considered flagship programming, then the survey findings about the extent of support for creationism in the US are hardly surprising.

“Factual entertainment” is a notable growth sector of television programming as broadcast organizations search for “event programs” capable of drawing mass audiences and, particularly in the UK, satisfying critics of public media channels. The tensions

between the “factual” and the “entertainment” present an important challenge to those interested in the relationship between science, scholarship and civil society. At present, and despite the honorable intentions of many of those involved on the production side, it is highly questionable whether wildlife and nature programming is making an appropriate contribution to the preparedness of civil society to deal with key issues in biological and environmental sciences. If this is educational television, just what are the lessons being learned?

Acknowledgements

The project reported here was funded by Grant R000223550 from the Economic and Social Research Council. We are grateful to our research assistant, Carolyn Hair, who carried out the practical tasks of recording and archiving the materials, and of identifying and preparing preliminary transcripts of selected portions. Robert Dingwall would also like to thank the American Bar Foundation in Chicago, where he was based as a Visiting Fellow during much of the final drafting of this paper.

Notes

- 1 This literature also tends to make little acknowledgement of the complexities of text/audience interaction. See Livingstone (1996) for a succinct summary of the relevant literature.
- 2 The channel’s website declares that, “Animal Planet brings together viewers of all ages by tapping into our fundamental fascination with animals and by providing a diverse mix of programming that tugs at viewers’ heartstrings, tickles their funnybones, stimulates their minds and makes their jaws drop in awe” (<http://corporate.discovery.com/brands/animalplanet.html>). Unless otherwise specified all websites were accessed on 1 August 2005.
- 3 Nor is this to suggest that wildlife documentary filmmakers are personally any less “committed” than the makers of “social problems” documentaries. Field observations by MA at the October 2002 Wildscreen festival, the main international trade event for the industry, documented the strong moral and ethical commitments of many participants. Although they accepted the constraints of the requirement to entertain, they also saw themselves as part of a much grander project to inform and educate, particularly about ecological and environmental concerns.
- 4 Trailing the US launch of *The Life of Mammals* on Discovery, the *Chicago Tribune* (8 May 2003) devoted 22¼ column inches to Attenborough’s skills as a presenter, concluding that “When it comes to man amid nature, David Attenborough is top dog.” See also Jefferies (2003).
- 5 Curiously, the only specific reference to audience response to wildlife programming that we have been able to locate comes from a recent book about imprisonment: “Apart from news, the other genre that was almost universally popular, and one that cut across all demographic distinctions, was nature/wildlife programmes on television” (Jewkes, 2002: 120). Some inmates referred to their educational value; prison staff drew attention to the way that many programs focus on power, hierarchy and violence. It hardly needs saying that the appeal is of images of a world elsewhere, “escapism” in a non-metaphorical sense. “‘When you are behind bars it’s wonderful to see animals roaming free’” (Jewkes, 2002: 120). Presumably this delight can *only* exist because the images are taken to represent “reality” and, by extension, that the descriptions and explanations in the programs are “true.”
- 6 This has not, however, prevented further legislative bans being proposed: in January 2002, the Washington State legislature was asked to pass a bill (Senate Bill 6500) declaring that the “teaching of the theory of evolution in the common schools of the state of Washington is repugnant to the principles of the Declaration of Independence and thereby unconstitutional and unlawful.”
- 7 Theistic evolution is a “mainstream” position that can be hard to distinguish from IDC (Isaak, 2000). Essentially, it asserts that God created the evolutionary process and may intervene in a limited way but is not a detailed designer in the sense of IDC. The Anglican physicist-theologian, John Polkinghorne (1991: 78), for example, rejects Paley’s idea of a Cosmic Craftsman but can envision “a Cosmic Planner who has endowed the world with precisely the right laws of nature.” He also sees possibilities for intervention in the indeterminacy of the quantum world, where environmental input may result in a selection between system-neutral alternatives, which may then set up a series of path dependencies with profound consequences (Polkinghorne, 1991: 45;

1994: 71–81). The Catholic position is slightly different, accepting that evolution is consistent with belief but that the endowment of humans with a soul is a Divine act. (See *Humani Generis*, 1951 (http://www.vatican.va/holy_father/pius_xii/encyclicals/documents/hf_p-xii_enc_12081950_humani-generis_en.html) and *Message to Pontifical Academy of Sciences* by Pope John Paul II, 22 October 1996.)

- 8 The term “public schools” is used throughout this paper in the international sense of schools funded by the state rather than in the UK sense of fee-paying private schools.
- 9 Some indication of the continuing level of activity can be tracked on the National Center for Science Education website (www.ncseweb.org). Accessed on 12 April 2005, this listed, in the preceding 60 days, a new bill (HB1007) to promote IDC in public education in Pennsylvania—the tenth new state bill to promote anti-evolutionist teaching to be introduced in 2005, further conflict in the Kansas Board of Education, an informal survey by the National Science Teachers Association reporting that 30 percent of respondents had experienced pressures against teaching Darwinian evolution, a Federal Court ruling against the Cobb County School Board, and pressures on IMAX movie theaters to drop films with evolutionary content. On 15 August 2005, *Time* magazine made the “evolution wars” its cover story, running over eight pages of the issue. On the same date, *USA Today* devoted a full page to debates on the same topic, provoking a series of reader letters that ran over most of the following week.
- 10 “Scientific-educational” employs a discourse of “fact” but in plainer format than blue chip, of which it could be said to be a dilute (cheaper) version; “Research team” follows the progress of a group of experts, sharing the personalization but not the populist style of the presenter-led/adventure genre; “Extinct” shares many of the representational conventions and the high production costs (from labor intensive special effects) with blue chip but its narratives are crucially different; “Reality attacks” is a form of drama-documentary parallel to those featuring the emergency services in which drama and titillation are uneasily wedded to public information messages; “Making of” explain how blue chip programs are made. (See also Aldridge and Dingwall, 2003.)
- 11 In fact, *The Blue Planet* was re-edited for cinema release as *Deep Blue* in 2003. It is notable, in the light of later comments on this page, that five different narrators are credited for UK English, US English, French, German and Hebrew versions of the same movie (<http://www.imdb.com/title/tt0365109/>).
- 12 When Jacques Cousteau was filming underwater in the Red Sea in the 1950s, he was at the leading edge of technology backed by an enthusiastic millionaire and the French navy. The locations that he discovered are now within easy reach of any passing backpacker with a widely available and affordable safety certificate.
- 13 The transcription is adapted from the Jefferson system used for conversation analysis. Numbers in parentheses refer to pauses estimated in tenths of a second. Letters in parentheses refer to the direction of the lighting in a shot: L = left; R = right; S = straight ahead; C = from behind the camera. Roman type is used for voice and italics for descriptions of pictures. Line breaks occur when the shot changes unless otherwise noted.
- 14 This is, of course, also a point at which some science enters more visibly in quoting a success rate for seal hunts (line 23). However, the open-endedness may also be distinctive to the BBC sourcing:

The problem with serious wildlife programmes is that they don’t always have happy endings and channels which rely on advertisers are reluctant to risk the consequences. One executive from a commercial TV company spelt out the problem: “We don’t want to make programmes that send people to bed feeling depressed,” she said. Given the current state of the environment, that makes serious wildlife film-making difficult. In contrast, the BBC can afford to be more robust, as Keith Scholey, the head of the corporation’s Natural History Unit, made clear: “On the BBC we show a lot of things being killed, including people. That’s what we’re about,” he said. (*The Guardian*, 12 February 2002)

The *Chicago Tribune* preview quoted in note 4 cautions viewers of *The Life of Mammals*:

As educational and entertaining and even inspirational as it all is, some of the footage is so revelatory it will likely be too much for younger kids. “Life of Mammals” treats as entirely natural the hunt, the kill and the bloody feast afterward. It doesn’t shy away from the finer details of procreation either . . . Parents who choose to watch this with their children—and there are scores of good reasons to do so—should be prepared: They’ll have some ‘splaining to do.

References

- Aldridge, M. and Dingwall, R. (2003) “Teleology on Television? Implicit Models of Evolution in Broadcast Wildlife and Nature Programmes.” *European Journal of Communication* 18: 435–53.
- Attenborough, D. (2002) *Life on Air: Memoirs of a Broadcaster*. London: BBC Books.
- Barker, E. (1985) “Let There be Light: Scientific Creationism in the Twentieth Century,” in J. Durant (ed.) *Darwinism and Divinity: Essays on Evolution and Religious Belief*, pp. 181–204. Oxford: Basil Blackwell.
- BBC Worldwide (2002) *Annual Review April 2001–March 2002*. URL: <http://www.bbcworldwide.com/aboutus/corpinfo/annualreps/annualreport2002> (accessed August 2005).

- Behe, M. (1996) *Darwin's Black Box: The Biochemical Challenge to Evolution*. New York: Simon and Schuster.
- Bishop, G. (1998) "The Religious World View and American Beliefs about Human Origins," *The Public Perspective* 9(5): 39–44.
- Bishop, G. (1999) "What Americans really Believe," *Free Inquiry* 19, URL: http://www.secularhumanism.org/library/fi/bishop_19_3.html (accessed August 2005).
- Bolter, J.D. and Grusin, R. (1999) *Remediation: Understanding New Media*. Cambridge, MA: MIT Press.
- Bousé, D. (2000) *Wildlife Films*. Philadelphia: University of Pennsylvania Press.
- Burgess, J. and Unwin, D. (1984) "Exploring the *Living Planet* with David Attenborough," *Journal of Geography in Higher Education* 8: 112.
- Collins, H.M. and Evans, R. (2002) "The Third Wave of Science Studies: Studies of Expertise and Experience", *Social Studies of Science* 32: 235–96.
- Collins, H.M. and Evans, R. (2003) "King Canute Meets the Beach Boys: Responses to The Third Wave," *Social Studies of Science* 33: 435–52.
- Condit, C., Ferguson, A., Kassel, R., Thadhani, C., Gooding, H.C. and Parrott, R. (2001) "An Exploratory Study of the Impact of News Headlines on Genetic Determinism," *Science Communication* 22: 379–95.
- Conrad, P. (2001) "Genetic Optimism: Framing Genes and Mental Illness in the News," *Culture, Medicine and Psychiatry* 25: 225–47.
- Corner, J. (1995) *Television Form and Public Address*. London: Edward Arnold.
- Corner, J., Richardson, K. and Fenton, N. (1990) "Textualizing Risk: TV Discourse and the Issue of Nuclear Energy," *Media, Culture & Society* 12: 105–24.
- Cottle, S. (2003) "Producing Nature(s): the Changing Production Ecology of Natural History TV", in S. Cottle (ed.) *Media Organization and Production*, pp. 170–187. London: SAGE.
- Coward, R. (1984) "The Sex-life of Stick Insects," in R. Coward (ed.) *Female Desire*, pp. 209–15. London: Grafton.
- Crowther, B. (1995) "Towards a Feminist Critique of Television Natural History Programmes," in P. Florence and D. Reynolds (eds) *Feminist Subjects, Multi-media*, pp. 127–46. Manchester: Manchester University Press.
- Davies, G. (2000) "Science, Observation and Entertainment: Competing Visions of Postwar British Natural History Television 1946–1967", *Ecumene* 7: 432–60.
- Dearing, J.W. (1995) "Newspaper Coverage of Maverick Science: Creating Controversy through Balancing," *Public Understanding of Science* 4: 341–61.
- de Cheveigné, S. and Véron, E. (1996) "Science on TV: Forms and Reception of Science Programmes on French Television," *Public Understanding of Science* 5: 231–53.
- Dembski, W.A. (ed.) (1998) *Mere Creation: Science, Faith and Intelligent Design*. Downers Grove, IL: Intervarsity Press.
- Dembski, W.A. (1999) *Intelligent Design: The Bridge between Science and Theology*. Downers Grove, IL: Intervarsity Press.
- Forrest, B. (2001) "The Wedge at Work: How Intelligent Design Creationism is Wedging its Way into the Cultural and Academic Mainstream," in R.T. Pennock (ed.) *Intelligent Design Creationism and its Critics: Philosophical, Theological and Scientific Perspectives*, pp. 5–53. Cambridge, MA: MIT Press.
- Gendall, P., Smith, T.W. and Russell, D. (1995) "Knowledge of Scientific and Environmental Facts: a Comparison of Six Countries," *Marketing Bulletin* 6: 65–74.
- Geraghty, C. (1991) *Women and Soap Opera*. Cambridge: Polity.
- Glasgow University Media Group (1976) *Bad News*. London: Routledge and Kegan Paul.
- Grant, B.K. and Sloniewski, J. (1998) *Documenting the Documentary: Close Readings of Documentary Film and Video*. Detroit: Wayne State University Press.
- Gregory, J. and Miller, S. (1998) *Science in Public: Communication, Culture and Credibility*. New York: Plenum.
- Gross, A.G. (1994) "The Roles of Rhetoric in the Public Understanding of Science," *Public Understanding of Science* 3: 3–23.
- Hall, S. (1980) "Encoding and Decoding," in S. Hall and University of Birmingham Centre for Contemporary Cultural Studies (eds) *Culture, Media, Language*, pp. 128–38. London: Hutchinson.
- Hall, S., Critcher, C., Jefferson, T., Clarke, J. and Robert, B. (1978) *Policing the Crisis: Mugging, the State and Law and Order*. London: Macmillan.
- Hermes, J. (1995) *Reading Women's Magazines: An Analysis of Everyday Media Use*. Cambridge: Polity Press/Basil Blackwell.
- Hilgartner, S. (1990) "The Dominant View of Popularization: Conceptual Problems, Political Uses," *Social Studies of Science* 20: 519–39.

- Isaak, M. (2000) "What is Creationism?," *The Talk Origins Archive* URL: <http://www.talkorigins.org/faqs/wic.html> (accessed August 2005).
- Iyengar, S. (1991) *Is Anyone Responsible?: How Television Frames Political Issues*. Chicago: University of Chicago Press.
- Jefferies, M. (2003) "BBC Natural History versus Science Paradigms," *Science as Culture* 12: 527–45.
- Jewkes, Y. (2002) *Captive Audience: Media, Masculinity and Power in Prisons*. Cullompton: Willan Publishing.
- Johnson, P. (1991) *Darwin on Trial*. Downers Grove, IL: Intervarsity Press.
- Kirby, D.A. (2003) "Science Consultants, Fictional Films and Scientific Practice," *Social Studies of Science* 33: 231–68.
- La Follette, M.C. (2002a) "A Survey of Science Content in US Radio Broadcasting, 1920s through 1940s: Scientists Speak in their own Voices," *Science Communication* 24: 4–33.
- La Follette, M.C. (2002b) "A Survey of Science Content in US Television Broadcasting, 1940s through 1950s," *Science Communication* 24: 34–71.
- Latour, B. and Woolgar, S. (1979) *Laboratory Life: the Social Construction of Scientific Facts*. Beverly Hills, CA: SAGE.
- Le Mahieu, D.L. (1976) *The Mind of William Paley: A Philosopher and his Age*. Lincoln, NE: University of Nebraska Press.
- Lewenstein, B.V. (1995) "From Fax to Facts: Communication in the Cold Fusion Saga," *Social Studies of Science* 25: 403–36.
- Livingstone, S. (1996) "On the Continuing Problem of Media Effects," in J. Curran and M. Gurevitch (eds) *Mass Media and Society*, 2nd edn, pp. 305–24. London: Arnold.
- Long, M. (1995) "Scientific Explanation in US Newspaper Science Stories," *Public Understanding of Science* 4: 119–30.
- Locke, S. (1994) "The Use of Scientific Discourse by Creation Scientists: Some Preliminary Findings," *Public Understanding of Science* 3: 403–24.
- Locke, S. (2005) "Fantastically Reasonable: Ambivalence in the Representation of Science and Technology in Super-hero Comics," *Public Understanding of Science* 14: 25–46.
- McCombs, M.E. and Shaw, D.L. (1993) *Communication and Democracy: Exploring the Intellectual Frontiers in Agenda-setting Theory*. Mahwah, NJ: Erlbaum.
- McQuail, D. (2000) *McQuail's Mass Communication Theory*, 4th edn. London: SAGE.
- McQuail, D. (2003) *Health News and the Mass Media: Some Reflections on Press Roles and Performance*. London: King's Fund.
- McRobbie, A. (1991) "Jackie Magazine: Romantic Individualism and the Teenage Girl," in A. McRobbie (ed.) *Feminism and Youth Culture: From Jackie to Just Seventeen*, pp. 81–134. London: Macmillan.
- Miller, D. and Philo, G. (1999) "The Effective Media," in G. Philo (ed.) *Message Received: Glasgow Media Group Research 1993–1998*, pp. 21–32. Harlow: Longman.
- Miller, S. (2001) "Public Understanding of Science at the Crossroads," *Public Understanding of Science* 10: 115–20.
- Morley, D. (1986) *Family Television*. London: Comedia/Routledge.
- Nelkin, D. (1976) "The Science-textbook Controversies," *Scientific American* 234(4): 33–9.
- Nelkin, D. (1982) *The Creation Controversy: Science or Scripture in the Schools*. New York: W.W. Norton.
- Nerlich, B., Dingwall, R. and Clarke, D.D. (2002) "The Book of Life: How the Human Genome Project was Revealed to the Public," *Health* 6: 445–69.
- Nerlich, B., Johnson, S. and Clarke, D.D. (2003) "The First Designer Baby: the Role of Narratives, Clichés and Metaphors in the Year 2000 Media Debate," *Science as Culture* 12: 471–98.
- Park, H.-J. (2001) "The Creation-Evolution Debate: Carving Creationism in the Public Mind," *Public Understanding of Science* 10: 173–86.
- Petersen, A. (1999) "The Portrayal of Research into Genetic-based Differences of Sex and Sexual Orientation: A Study of 'Popular' Science Journals, 1980 to 1997," *Journal of Communication Inquiry* 23: 163–82.
- Polkinghorne, J. (1991) *Reason and Reality: The Relationship between Science and Theology*. London: SPCK.
- Polkinghorne, J. (1994) *Science and Christian Belief: Theological Reflections of a Bottom-up Thinker*. London: SPCK.
- Radway, J. (1984) *Reading the Romance*. Chapel Hill: University of North Carolina Press.
- Rogers, E.M., Hart, W.B. and Dearing, J.W. (1997) "A Paradigmatic History of Agenda-setting Research," in S. Iyengar and R. Reeves (eds) *Do the Media Govern? Politicians, Voters and Reporters in America*, pp. 225–36. Thousand Oaks, CA: SAGE.
- Scott, K.D. and White, A.M. (2003) "Unnatural History? Deconstructing the Walking with Dinosaurs Phenomenon," *Media, Culture & Society* 25: 315–32.

- Stouffer, M. (1988) *Wild America*. New York: Times Books.
- Treneman, J.S.M. (1967) *Communication and Comprehension*. London: Longman.
- Turney, J. (1998) *Frankenstein's Footsteps: Science, Genetics and Popular Culture*. New Haven: Yale University Press.
- Wheatley, H. (2003) "The Limits of Television? Natural History Programming and the Limits of Public Service Broadcasting," *European Journal of Cultural Studies* 7(3): 325–39.
- Wilson, A. (1992) *The Culture of Nature: North American Landscape from Disney to the Exxon Valdez*. Oxford: Blackwell.
- Winston, B. (1995) *Claiming the Real: The Documentary Film Revisited*. London: British Film Institute.
- Wynne, B. (1992) "May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide," in S. Lash, B. Szerszynski and B. Wynne (eds) *Risk, Environment and Modernity: Towards a New Ecology*, pp. 44–83. London: SAGE.
- Wynne, B. (1995) "Public Understanding of Science," in S. Jasanoff, G.E. Markle, J.C. Petersen and T. Pinch (eds) *Handbook of Science and Technology Studies*, pp. 361–88. London: SAGE.

Authors

Robert Dingwall is Professor and Director of the Institute for the Study of Genetics, Biorisks and Society at the University of Nottingham. His work has included projects on bioethics and the governance of science and on representations of the Human Genome Project. He is currently leading projects on the incorporation of genetic medicine into the UK National Health Service, and on the implications for public health early warning systems of national responses to the August 2003 heat wave in France and the UK. He is now developing new studies on the social implications of developments in neuroscience.

Correspondence: Institute for the Study of Genetics, Biorisks and Society, Law and Social Sciences Building, University of Nottingham, University Park, Nottingham NG7 2RD, UK, e-mail: Robert.dingwall@nottingham.ac.uk

Meryl Aldridge is Reader in the Sociology of News Media in the School of Sociology and Social Policy, University of Nottingham, UK. Her particular interests are local/regional media, the press, journalism as an occupation, media and gender, and the media representation of social issues.