

## Narrating the Dinosaurs: Pushing the Public Understanding of Science<sup>1</sup>

### 1. Introduction

Nature documentaries are ubiquitous. Not only do they populate government-funded television, they also thrive on the Discovery Channel and in IMAX cinemas. Normally they concern the present biosphere.

Yet with the BBC series *Walking with Dinosaurs* (1999), *Walking with Beasts* (2001) and *Walking with Cavemen* (2003), it is the past that comes to life: In the common style of nature documentaries, dinosaurs, giant mammals and hominids of ages past are presented just as if we were able to encounter and observe them in real life.

Similar to *Jurassic Park* (1993/1997/2001), the dinosaurs emerge on celluloid with the aid of computer animation; but unlike *Jurassic Park* and Disney's *Dinosaur*, the focus lies on the communication of science. For this, the series mimics the filmic language of "real" nature documentaries. Due to the artificial nature of the animals, the series can be understood as unmasking the techniques used in such documentaries.

This paper now aims at introducing the series and discussing some issues related to its scientific and documentary aspects. For reasons of brevity, I will concentrate on examples from the first of these series, *Walking with Dinosaurs*. But most of the points will be relevant for the other series as well, as they are very similar in their approach.

### 2. Description

In the past, fossils were believed to be bones of demons, or simply grotesque shapes placed there by the devil. It is science telling us that there is an alternative explanation, that there is a far more interesting and far more fascinating story behind the creation of life.

Sadly, this story can often only be read in books, or visited in museums where fossilized bones are displayed, providing us only with a faint hint at the past. To make the facts of evolution more accessible to a general audience, to tell the tale of the past, is a task demanding for a narrative and a story.

Producer Tim Haines thus describes the series *Walking with Dinosaurs* as an update to museum work: "If you walk into a museum, you'll see pictures, murals, statues, and skeletons, all of which are combinations of speculation and fact" (Poniewozik). The museum built by Haines is accessible via television and video. Based upon actual fossils, models and animatronics have been created for close-up scenes, often only bit parts like the head of a Pterosaur. The models would be scanned and read by a computer, and the task of visual effects specialists would be to animate them, under the careful guidance of palaeontologists. For the filming, real environments were scouted. The environments had to be very specific. Even a single blade of grass would have betrayed the illusion, as grass was to evolve only much later. Humans had to prepare the filming in the real environment, creating footprints,

---

<sup>1</sup> Talk held at the conference „Capturing the... Truth? Changing Strategies in Documentary Cinema." Berlin, February 8-11, 2005.


moving leaves and creating waves in the water. The digital dinosaurs would then be added to fit the footprints left by the humans.

The process was an arduous one. There exists no direct record of the movement of dinosaurs, but with a careful study of the fossils it is possible to take educated guesses. Fossils can tell what animals ate, who ate them, what their surroundings were, how their bodily weight was distributed, and so on. There exist fossils of dinosaur skin, eggs, plants, even dinosaur faeces, so a lot is actually known.

Regarding their movement, as no dinosaurs exist today, there are no direct comparisons possible. Elephants, the biggest land mammals of our time, are much smaller than the biggest dinosaurs, so their weight problem is nothing compared with a giant Sauropod. Elephants also have much larger brains than the biggest dinosaurs had, which will have an effect on the fluidity of their movement<sup>2</sup>. Dinosaurs simply lack circuitry, if compared to more modern animals. Thus making a dinosaur move in the computer would mean to answer several questions. For palaeontology, this even constituted a study of sorts: providing inspiration for real research, utilizing animation technology to tackle the problem of dinosaur movement.

The series itself consist of six episodes of 30 minutes each, spanning the time from the appearance of the first dinosaurs in the Late Triassic, 220 million years ago, to their demise in the Late Cretaceous, 65 million years ago. The area covered spans the precursors of North America, Europe, Africa and the ancient Polar Continent consisting of South America, Antarctica and Australia. The habitats shown range from land to sea and into the skies.

The programs follow individual animals throughout the story of an episode, using them as protagonists. Narrator for the British original is Kenneth Brannagh, for the American version, Avery Brooks. To illustrate the overall style of the series, we will now see an excerpt of episode four, "Giants of the Sky".

 Title sequence till "to find a mate"

 Ornithomimus as protagonists, narration/focalization, flight DVD chapter 2

From this excerpt we can discern the following elements:


- The program uses a highly poetic narrative style featuring an omniscient narrator, thus mirroring the format of other nature documentaries.
- The narration nevertheless features a very factual approach. Though the DVD version features an extensive "Making Of"-documentary for the documentary, plus the option to hear sporadic commentaries on scientific aspects during the presentation of the program, the episodes themselves present reconstruction as solid facts. Though it should be clear to the educated viewer that our knowledge about dinosaurs cannot be obtained by simply filming them in their natural habitat, the power of the images oftentimes appears overwhelming. This may well be the curse of the visual image – something seen appears more real than something read.

The mimicry of real-life nature documentaries goes even further. For this, I shall present a second, much briefer example from the fifth episode, "Spirits of the Ice Forest". The following excerpt depicts a night scene<sup>3</sup>.

---

<sup>2</sup> Making-of Documentary

<sup>3</sup> Due to specific technical constraints of the respective DVD set, I cannot provide detailed time codes.

 Night view: “But with image-enhancement, it is possible to get a *Leaellynasaura*’s-eye view of the clan,” last chapter of episode on DVD

Isn't this a bit absurd? The dinosaurs are artificial, yet we need to “enhance” the image so that we can see more closely what's going on. Of course this is a technique all of us will have seen in other nature documentaries. So this appears to follow the conventions of the genre, as genres guide both perception and production by providing some sort of familiarity. A genre can also bestow authority in its field for those works following it. As the aim of the documentary, in contrast to fiction, appears to be the depiction of the factual, appealing to nature documentaries can be understood as underscoring the quest for realism.

Yet doesn't the obvious need for narration, the need for story, for connecting the dots, create problems of its own? How is the scientific aspect represented? Can the program be “realistic” at all? Or is this just a human interest story in the shape of a nature documentary?

### 3. Criticism

By staging its narrative in a very specific way<sup>4</sup>, scientific theory is presented as solid fact. Does that apparently deliberate method constitute an unnecessary compromise, compromising hard-won evolutionary science itself, or could it be seen as a concession to aid the public understanding of science, capturing the truth in small, entertaining increments?

Some critics like Mark Norell, chairman of palaeontology at the American Museum of Natural History, single out the entertainment factor, criticizing the series for presenting as fact what can only be educated guesses: “We have found a few great fossils that give us a sense of behavior, but it's very little. [...] This stuff is just as fake as Jurassic Park”, he says (Poniewozik). Equally, though the BBC sought help from one hundred palaeontologists from numerous countries, the consulting palaeontologists have been named prostitutes by some colleagues (Benton).

There are indeed some problems.

The program often hints at evolution, but often, perhaps necessarily though, in an utterly simplified manner. New species often simply “arrive”. Some traits have simply “evolved”. Though the principles behind that simplified speech are now well understood, the poetic style of narration may in itself create an awkward barrier of obfuscation by simplification.

Equally problematic is the teleological perspective, which enters the program admittedly through hindsight when it mentions that some species “is about to evolve into birds”, or in another place, that “with [the Sauropods'] passing, life will never be this large (episode 2, “Time of Titans”). Though these statements are technically correct, they may fuel the teleological fallacy that evolution, somehow, would be directed. In this vein, previous species would be understood mainly as precursors to “modern” species, leaving out that all life is transient and the direction unknown. Evolution is not about direction, not about an aim, but about adaptation.

Another point fuelled by the style of narration is a smack of anthropomorphism, which is something that haunts most nature documentaries. It may be very human to see volition where there's automation, to see consciousness on an either-or basis rather than as a matter of degree. But though this is even more so a problem with movies like Disney's *Dinosaur*, it may obscure the much more complex processes behind life and consciousness.

---

<sup>4</sup> cf. Richard Dawkins, the “BBC Theorem”, for language of webs & networks (Dawkins 1999, 236f)

#### 4. Science and Wonder: Conclusion

So do we abandon the idea of documentaries being able to capture the truth? Shall we stick to strict science rather, to scientific articles with minimal need for narration, based upon rigid fact-finding missions in laboratories and in the field? Shall we prefer accuracy over speculation?

Firstly, this is about communicating scientific findings. This holds true for each branch of academia. Recent studies regarding scholarly aptitude in Europe have shown an alarming decline not only in scientific knowledge but also in language and cultural skills. The United States, amongst others, are plagued by the rise of creationism and its associate, the so-called Intelligent Design movement, who intend to relegate not just evolution but all critical science to the status of being “just a theory” (though a theory, in contrast to a mere hypothesis, is already a thoroughly understood system). Popularizers of evolution like Richard Dawkins and the late Stephen J. Gould have been battling this return to the age of Genesis. Similarly, Carl Sagan, Isaac Asimov and Stephen Hawking have done popularizing work for physics. Literary and Cultural theory as well could well make use of popularizers as Harold Bloom, Umberto Eco, Marcel Reich-Ranicki and the late Dietrich Schwanitz. Promoting the public understanding of science and academia is a job deeply necessary, though often ridiculed by the promoters of pure science.

But there is also another kind of argument. All of science, the humanities duly included, does not just move forward through a necessary but hidden and arduous process of fact-gathering. Science is equally propelled forward through educated guesses, through fantasizing, reaching out into the unknown. Science desperately needs, and utilizes, what Richard Dawkins calls the “appetite for wonder” (1996).

So, to conclude, it appears that oftentimes a certain amount of educated imagination and speculation, though not necessarily following a rigid scientific path towards the truth, can nevertheless capture it.

And if, in the process, we should be entertained as well, why not?

#### 5. References

- Walking With Dinosaurs*. Producers: Tim Haines, Jasper James et al. British Broadcasting Corporation (BBC), Discovery Channel, France 3 (FR 3), Pro 7, TV Asahi. 1999.
- Benton, Michael J. “Why I dared walk with TV dinosaurs.” <http://palaeo.gly.bris.ac.uk/dinosaur/wwd.html> (06/01/2009).
- Dawkins, Richard. *The Extended Phenotype. The Long Reach of the Gene (Revised Edition)*. Oxford: Oxford UP, 1999. (1<sup>st</sup> Edition 1982).
- . *The Blind Watchmaker*. London: Penguin, 1986.
- . *River Out Of Eden*. New York: BasicBooks, 1995.
- . “Science, Delusion and the Appetite for Wonder.” *Richard Dimbleby Lecture, BBC1 Television*. 12 November 1996. <http://richarddawkins.net/article,3,Science-Delusion-and-the-Appetite-for-Wonder,Richard-Dawkins> (09/05/2007).
- . *Unweaving the Rainbow. Science, Delusion and the Appetite for Wonder*. Boston/New York: Mariner Books, 1998.
- Poniewozik, James. “A Modern Jurassic Family.” *Time*, April 10, 2000. <http://www.time.com/time/magazine/article/0,9171,1101000417-42847,00.html> (06/01/2009)

Public Understanding of Science | Read 38 articles with impact on ResearchGate, the professional network for scientists. I narrate how scientific advice matured from an approach based on compliance with guidelines to a style of "public science" in which issues such as trust and democracy were intertwined with scientific risk assessment. This paper develops existing conceptions of the "public understanding of science" with an explanation based around the co-production of scientific and social order. Scientists classify dinosaurs into two orders – Saurischians and Ornithischians – based on the structure of the bones in their hips. (This saurischian and ornithischian grouping is now disputed. See the "Family tree update" section below to learn more.) Most of the well-known dinosaurs – including Tyrannosaurus rex, Deinonychus and Velociraptor – fall into the order known as Saurischian dinosaurs (pronounced sor-ISK-ee-en). During the age of the dinosaurs, a lot was happening below the surface of the world's oceans. The "fish flippers," or ichthyopterygia, includes Ichthyosaurus – the streamlined, tuna- and dolphin-shaped ocean-going predators. This abundant family of marine reptiles largely went extinct at the end of the Jurassic Period.

Dinosaur cloning. (B) Carnivorous dinosaurs of Dinosaur Park Formation if the largest carnivore were scaled equally to the largest mammalian carnivore in Kruger. Infants (gray) of the largest species shown below adult to show relative growth requirement. Although the overall distribution of carnivore body size was consistent, the gap itself was dynamic. In fact, the dinosaurs that have been unearthed in the UK are, by and large, a relatively obscure bunch. Yet Britain still holds a very special place in the history of dinosaur science. It was there that the first fossil dinosaur fragments were studied by scientists; there that the first essentially complete dinosaur skeleton was unearthed; there that the very word "dinosaur" was born about 170 years ago; and there that the name almost died just a few decades later. It's anyone's guess exactly where and when humans first stumbled upon the fossilised remains of ancient giant