GÖTEBORGS UNIVERSITET

INSTITUTIONEN FÖR LITTERATUR, IDÉHISTORIA OCH RELIGION

Simulating Wildlife Experiences

A History of Natural History in the BBC

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Termin: HT2020

Kurs: IL2501, 15 hp

Nivå: magister

Handledare: Gustav Holmberg

Abstract

This study places the BBC series *Walking with Dinosaurs* (1999) in the context of the history of wildlife filmmaking in the BBC, which began in the 1950's. Despite *Walking with Dinosaurs*'s use of digital animation, as opposed to mechanical objectivity, a comparison of the intentions and epistemic notions of the creators of the program to those of their predecessors reveals a historical continuity in epistemic values, as well as in ideas regarding what positions natural history programs should hold in the circulation of knowledge between the scientific community, television, journalists, and the public. The BBC sees itself as a semi-autonomous creator of knowledge on the topic of natural history. Wildlife filmmakers in the corporation consider the unique value of the kind of knowledge-of-nature that they produce to consist of experiential and holistic qualities which they do not consider scientific knowledge to embody. Previous BBC attempts at tackling prehistoric life were frustratingly stuck in a descriptive, scientific mode. *Walking with Dinosaurs* represented a breakthrough in the desire to create experiential and holistic knowledge on prehistoric life, as well as a progression in the already established BBC practice of presenting science as unfinished business rather than a set of established facts, and to act as an arbiter in scientific debates.

Keywords: BBC, Walking with Dinosaurs, wildlife documentaries, natural history films, circulation of knowledge, the linear model, mechanical objectivity.

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1. Introduction

Knowledge by way of experience is not the same as knowledge by way of information. To know someone is completely different than reading a list of attributes about that someone. This epistemic insight is what natural history documentaries have drawn upon since their beginnings. To urbanized populations, which have grown increasingly detached from nature, wildlife programs can function like windows into the natural world, which seem to offer experiences of it rather than merely descriptions. Experiences with which, in some ways, scientific information cannot compete. At least this is one way of viewing the matter. A view which renders the epistemic role of wildlife television a challenge to the commonly held notion that the relationship between science, the media, and the public is unidirectional and hierarchical.

All of this is interesting in its own right, but how does a simulated natural history documentary fit into the picture? In 1999 a BBC documentary, entitled *Walking with Dinosaurs*, which used CGI animations to realistically simulate dinosaurs in the style of classic BBC wildlife films, exploded onto the scene.[1] Millions of people watched dinosaurs grazing, hunting, mating, and facing the challenges of shifting seasons, all to the sound of Kenneth Branagh's voice, whose narration was referred to by some as "Attenboroughese".[2] The series was popular and the BBC subsequently produced many more in its style.

Considering the massive influence of the BBC, reflecting on the implications of this new kind of natural history programming drew interest from some academics who attributed it primarily to a new infatuation with postmodern aesthetics, notions which were popular in academia at the time. Analyzing the series, instead, within the context of its institutional history, might render some contrasting and expanding results.

Inquiries and aims

The inquiries of this thesis will, therefore, exist on two levels: one focused and one broad. Focused questions will be put forward in contrast to previous academic research and pertain to

[1] *Walking with Dinosaurs,* BBC, 1999.
[2] Robert Matthews, "Why dinosaurs won't go away", *The Guardian* 1999-10-22, https://www.theguardian.com/media/1999/oct/22/bbc.g2 [retrieved 2020-01-13].

whether or not *Walking with Dinosaurs* represents a historical shift in the history of BBC natural history programming. The broader inquiries will pertain to the opening reflections of the cultural importance of wildlife documentaries and, therefore, to what kinds of positions the BBC can be said to hold in the circulation of knowledge between science, media, and audiences, in relation to the natural world.

Does *Walking with Dinosaurs* represent a significant shift in the BBC's natural history programming, or can it be placed, rather, in continuity with historical developments within the BBC? Whether it is a shift or a continuation, or both, what does this imply about the epistemological underpinnings of natural history filmmaking in the BBC? And on a broader note, what can these implications tell us about the ways in which the BBC has engaged in the circulation of knowledge about the natural world?

The aims of these questions are to deepen the understanding of arguably one of the most influential communicators of knowledge-of-nature in the world. Considering the BBC's important epistemic position, reflection on the implications of the relatively late development within the corporation of creating simulated documentaries is a highly relevant pursuit, not least in light of the fact that key figures in the history of BBC wildlife filmmaking have been, and are still, actively engaged in environmentalist causes—something which will briefly be accounted for in closing, under the subtitle "Future research". Let us begin, however, at the opposite end of the timeline.

Previous research

In "'Screen natures': Special effects and edutainment in 'new' hybrid wildlife documentary", Phil Bagust describes his view of *Walking with Dinosaurs* (and other programs like it) as a consequence of television producers responding to growing commercial pressures by tailoring their content to appeal to a gaming-savvy generation which had come to expect special-effects from its media.[3] The series is placed, by Bagust, within a very broad historical context of pre-CGI manipulative techniques in nature documentaries, such as "fenced enclosures and staged

[3] Phil Bagust, "'Screen Natures': Special Effects and Edutainment in 'new' Hybrid Wildlife Documentary", *Continuum (Mount Lawley, W.A.)* 22.2 (2008), pp. 213-226.

dramatic confrontations between animals."[4] *Walking with Dinosaurs* is therefore viewed by Bagust as a progression of a historical pretense of objectivity which has been fueled further by postmodern attributes of hybrid-media and self-referential elements, allowing for a "consensual fantasy" between viewers and media creators of a nature that does not "exist anywhere, except in the minds of both the producers and the audience".[5]

Bagust himself, however, points out that the manipulative history which he refers to (via Derek Bousé) is primarily from the American tradition, and that the British tradition was "less invasive" and had more in common with "the nineteenth-century village 'nature rambler' and observer," something which he describes as culminating with Attenborough's classic series *Life on Earth* (1979).[6] He dismisses this difference between the American and British traditions, however, by saying that in a modern context it is "being actively erased by the infotainment imperatives of the global media marketplace."[7]

It is true that *Walking with Dinosaurs* has a global aspect to it which means in some ways it had to take into account international, and perhaps primarily American, viewers. During its pre-production the BBC found global financial partners in the Discovery Channel and other outlets with the understanding that the program would be televised on these distribution channels as well. Putting this in heavy contrast to *Life on Earth*, however, as Bagust does here, seems slightly rhetorical considering that *Life on Earth* was in fact the program which established this practice of enabling massively ambitious projects through the acquiring of funds external to those available to the BBC, by way of finding international partners who would, in exchange for distribution rights, provide funding to the program. Others have pointed out, on the other hand, that such arrangements have been met by increasing demands from international partners.[8] Nevertheless I remain sceptical to the idea that this warrants analyzing *Walking with Dinosaurs* as primarily a global phenomenon and more or less without reference to the specific history of the BBC.

In "Simulating Natural History: Walking with Dinosaurs as Hyper-Real Edutainment", Andrew Darley, who views *Walking with Dinosaurs* in very much the same light as Bagust,

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[4] Bagust 2008, p. 217.
[5] Idem, pp. 220-224.
[6] Idem, p. 217.
[7] Ibid.
[8] Andrew Darley, "Simulating Natural History: Walking with Dinosaurs as Hyper-Real Edutainment." *Science as Culture* 12.2 (2003), p. 238.

describes what he calls "the conceit of producing an Attenborough-style treatment of dinosaurs" as a product of postmodern practices like "simulation, pastiche and hyper-realism."[9] His analysis centers around the idea that this focus on the aesthetic aspects has come at the cost of content and meaning and that the series should be viewed, fundamentally, as an "aesthetic project" which uses science as a "legitimization for what is being attempted at the aesthetic level".[10] As with Bagust, Darley sees this "problematic" development in natural history programming as a consequence of the commercial pressures of a global market, and assumes, without reference to any quotes by the producers involved, that "the decision to cover the subject as simulated natural history [...] and to tie the series into Hollywood special effects was strategically shrewd" rather than motivated by any commitment on the BBC's behalf to produce educational, public service content.[11]

Although both Bagust and Darley make valid points about new media and new expectations from viewers, as well as questionable aspects of the scientific validity of *Walking with Dinosaurs* and, historically, natural history documentaries in general, it seems to me that both of these analyses lack insight into what the figures behind the media intended and how their intentions related to their own institutional history. For these reasons, my research has not focused on postmodern attributes and technologies of manipulation being spurred on by increasingly globalized markets but rather on how *Walking with Dinosaurs* relates to the historical development of the epistemic values within the British tradition and specifically within the BBC, which, despite international funding partners, were the creators of the series.

Secondary literature

The creator of *Walking with Dinosaurs*, Tim Haines, began his BBC-career at the prestigious Natural History Unit (NHU), in Bristol—the unit behind most of the David Attenborough classics.[12] Although Haines had moved to the Science Unit in London by the time he pitched and produced *Walking with Dinosaurs*, he explicitly expresses that it was in the legacy of NHU's

[9] Darley 2003, pp. 229-245.
[10] Idem, pp. 250.
[11] Idem. pp. 250-251.
[12] BBC, "TV Series", *BBC* [website], 2001, accessed via *The Wayback Machine* [internet archive website] https://web.archive.org/web/20010913014902/http://www.bbc.co.uk/dinosaurs/tv_series/index.shtml [retrieved 2021-01-13].

classics, like *Life on Earth* (1979), which he conceptualized and produced the series.[13] I will therefore be analyzing *Walking with Dinosaurs* within the historical context of earlier BBC natural history programs with a specific focus on the legacy of the NHU.

This will mean contrasting and comparing my own empirical material with the research and findings of Jean-Baptiste Gouyon, who, as author of the book *BBC Wildlife Documentaries in the Age of Attenborough* (2019), and the paper "The BBC Natural History Unit: Instituting Natural History Film-Making in Britain" (2011), has produced a rigorous and fascinating historical account of the history of wildlife productions in the BBC, which, to summarize immensely, concludes, among other things, that the BBC considers itself to be a semi-autonomous producer of knowledge in the field of natural history.[14] Although Gouyon touches briefly on some recent productions, his research centres on the historical development from the very beginnings of wildlife programs in the UK up until the production of Attenborough's classic series *Life on Earth* (BBC 1979), which Gouyon and many others consider to be the culmination of the BBC's epistemic approach to knowledge-production in natural history, as well as the solidification of a style of wildlife filmmaking which continues to be the norm in the British tradition to this day.

This time span (roughly 1950 to 1980) is fitting, as my own empirical material, while focusing on the release of *Walking with Dinosaurs* in 1999, spans BBC productions from 1989 to 2016 and therefore, to a small extent, offers a continuation of the historical account in Gouyon's research. In this thesis, the findings of Gouyon will primarily be accounted for in the chapter entitled "Background". The chapter supplements Gouyon's research, however, with another historical account given by David Attenborough himself in his book *A life on Air: Memoirs of a Broadcaster* (2016).[15] In this section, for reasons which will become clear, I will also be making a brief detour into the history of "field science" by way of Robert E. Kohler and Jeremy Vetter's chapter in the anthology *A Companion to the History of Science*, entitled "The Field".[16]

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[13] Tim Haines & Impossible Pictures, "The History of the Making of Walking with Dinosaurs", *Walking with Dinosaurs: The Origins* [website], 2013, obsolete but accessed via *The Wayback Machine* [internet archive website], https://web.archive.org/web/20131021015129/http://walkingwithdinosaurs-theorigins.com/index.php [retrieved 2021-01-13]; Davis, Shaun, "Interview: Tim Haines", *SciFiNow*, 2009-06-01, https://www.scifinow.co.uk/blog/interview-tim-haines [retrieved 2021-01-13].

[14] Jean-Baptiste Gouyon, *BBC Wildlife Documentaries in the Age of Attenborough*, (London: Palgrave Macmillan, 2019); "The BBC Natural History Unit: Instituting Natural History Film-Making in Britain." *History of Science*, 49.4 (2011), pp. 425-451.

[15] David Attenborough, *A life on Air: Memoirs of a Broadcaster*, (London: BBC Books, 2016).

[16] Robert E. Kohler & Jeremy Vetter, "The Field", in Bernard Lightman (ed.), *A Companion to the History of Science* (Chichester: John Wiley & Sons, 2016), pp. 282-295.

This historical account of natural history programming in the BBC will, in turn, be contextualized with a short account of the history of wildlife films, and their epistemic consequences, from the advent of cinematography in the late 1800s to the first televised natural history programs of the BBC in the mid-1900s. For this brief context I will be relying on the work of David Kirby and his chapter in *A Companion to the History of Science* (2016), entitled "Film, Radio, and Television", which gives a historical account of these mediums and how their development related to science and the scientific community.[17] Kirby describes how cinematography as an invention was tied up with the study of animals, and with the life sciences in general, from the very beginnings of the technology, because motion pictures were perceived to objectively capture time and movement.

In discussing this notion, the term "mechanical objectivity," which was coined by historians of science Lorain Daston and Peter Galison, will be of use.[18] In their book *Objectivity* (2007) which analyzes how the imagery of scientific atlases of the natural world evolved over time, Daston and Galison found that, generally speaking, the atlas illustrations of the eighteenth and early nineteenth centuries were attempting to capture the essence of whatever specimen they were representing, and so anomalies of the individual model in front of them (a missing flower pedal, an abnormally shaped bone, etc.) were realities that were seen as obfuscating the general "truth" of the specimen, and were subsequently worked around.[19] In the mid-nineteenth century, however, atlas makers became increasingly suspicious of idealistic representations and turned more and more to mechanical recordings of nature in order to eliminate their own interpretation of the objects being represented. This new epistemological and moral view is what the authors refer to as mechanical objectivity.[20] While Gouyon, Attenborough, Kirby, Kohler and Vetter will be referred to in a specific and focused manner, Daston and Galison will be referenced only through the application of their terminology.

In a much broader and implicit sense this thesis can be said to be drawing on the historiographical perspective laid out by historian of philosophy and science, James Secord, in his influential paper "Knowledge in Transit" (2004), which describes the development within the field as one which moved from writing history as a series of "big pictures" marked by stark shifts

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[17] David A. Kirby, "Film, Radio, and Television", in Bernard Lightman (ed.), *A Companion to the History of Science* (Chichester: John Wiley & Sons, 2016), pp. 428-42.
[18] Lorraine Daston, & Peter Galison, *Objectivity*, (New York: Zone, 2007).
[19] Idem, pp. 55-105.
[20] Idem, pp. 115-183.

(e.g. the Scientific Revolution, the Chemical Revolution, the Darwinian Revolution, the Einsteinian Revolution, etc.) to producing a more complex view of history through the writing of "microhistories" (e.g. the history of an institution).[21] While celebrating this development Secord urges his colleagues to fight the tendency for these microhistories to be written as if they were in isolation from one another and to instead focus on the ways in which knowledge moves and circulates between and through various areas of society, and what the implications of this circulation might be:

> I am sure that we need to think much more explicitly about the problem of the movement of local knowledge. [...] Questions of trust, testimony, and communitarian objectivity are simultaneously questions of how knowledge travels, to whom it is available, and how agreement is achieved. [...] This means thinking always about every text, image, action, and object as the trace of an act of communication, with receivers, producers, and modes and conventions of transmission. It means eradicating the distinction between the making and the communicating of knowledge.[22]

In this vein, a general precept of my research (as well as Gouyon's) is that the production of knowledge about the natural world is not exclusive to the scientific community but something which independent actors, such as natural history filmmakers, partake in. The more focused goals of my research, therefore, are placed within a broader objective of describing the various ways in which knowledge is produced, communicated and circulated between natural history filmmakers, viewers, journalists, and the scientific community. In this regard, however, weight will be placed primarily on the media's role in this dynamic situation, rather than the role of scientists.

This focus on media in relation to science and the public, within the broader context just described, places my analysis, more precisely, in alignment with the historiographical perspective described by historian of ideas, Anders Ekström, in the introduction to the anthology *Den mediala vetenskapen* (2004).[23] Ekström describes the unifying ambition of the various microhistories in the book as one which aims to complicate and problematize what he calls the "linear model"—a model which views the relationship between science and media in a

[21] James A. Secord, "Knowledge in Transit", *Isis* 95.4 (2004), pp. 654-657.
[22] Secord 2004, pp. 660-661.
[23] Anders Ekström (ed.), *Den Mediala Vetenskapen*, (Nora: Nya Doxa, 2004).

one-directional and hierarchical manner, seeing science as creating knowledge and the media as simply translating it into understandable terms and communicating it to the public.[24] Ekström et al. are, instead, interested in the ways in which knowledge circulates between the scientific community, producers of media, and audiences.[25] Ekström points out that the ambition to paint a more complex and accurate picture in this regard has had terminological consequences for the researchers in the book who have preferred to avoid the use of terms like "popular science," as such terms, in and of themselves, imply the linear model as an underlying truth—a terminological notion which Secord underscores as well.[26] Following the lead of these researchers, I have attempted to avoid such terms myself, and, for the same reasons, further excluded the terms "infotainment" and "edutainment," which both Bagust and Darley apply in their analyses.

Materials and methods

As explained, the focus of this research will be to examine how *Walking with Dinosaurs* relates to the history of the wildlife documentaries in the BBC and what this relationship can tell us about the epistemological underpinnings of one of the worlds most influential communicators of knowledge about the natural world. In pursuing this goal, and with Secord and Ekström in mind, I will analyze the ways in which key figures within the BBC's Natural History Unit viewed their own roles in the production and communication of knowledge and how these views compare to those of the creators of *Walking with Dinosaurs*. For *Walking with Dinosaurs*, therefore, my empirical material will consist of all six episodes of the series itself, as well as the accompanying program *The Making of Walking with Dinosaurs* (BBC 1999) which gives insights into the process behind the production as well as the values and aims of the people involved. In order to further understand the epistemic dynamics of key figures involved, and how these relate to the scientific community, I have also examined a number of interviews with Tim Haines, as well as interviews with, and articles by, some of the paleontologists consulted by the production.

[24] Anders Ekström, "Vetenskaperna, medierna, publikerna", in Ekström (ed.), 2004, pp. 9-13.
[25] Idem, pp. 14-15.
[26] Idem, pp. 15-16; Secord 2004, p. 670.

In considering how the series was and is presented by the BBC, I have looked at the current *Walking with Dinosaurs* webpage on the BBC's website, as well as, various official websites connected to the series which are now obsolete but available via the internet archive website The Wayback Machine. In further evaluating the BBC's own view of the series I have studied the BBC's *Annual Report and Accounts* in the years surrounding its release, which I have accessed through the British Online Archives. *Annual Report and Accounts* is a document created and submitted yearly by the BBC to the British Parliament in order to account for the ways in which public service finances have been spent and what results they have produced. Most of the BBC's archived material must be viewed physically at the BBC's Written Archive Center, which has been closed for visiting researchers during the covid-19 pandemic. These accounts, however, are some of the few archived objects which the Archive Center has made accessible online via the British Online Archives, for a fee, and they provide some insight into the BBC's own evaluation of *Walking with Dinosaurs.*

In contrasting these internal views of the production I have also studied various materials in order to gain an understanding of the program's external reception. These include critics' reviews and articles about the series, as well as viewers own ratings and reviews of the show. I will, as mentioned, also be contrasting my material to the findings of Gouyon and thus indirectly to earlier BBC productions, most notably *Life on Earth* (BBC 1979) which I have examined as well but which is most often referred to by way of Gouyon. Programs, other than *Walking with Dinosaurs*, which I specifically reflect upon as my own empirical material are primarily *Lost Worlds, Vanished Lives* (BBC 1989), *Attenborough and the Giant Dinosaur* (BBC 2016), and *Attenborough's Passion Projects* (BBC 2016). The reason for choosing these programs in particular are that they, like *Walking with Dinosaurs,* deal with the subject of paleontology and dinosaurs and therefore face similar challenges to *Walking with Dinosaurs*. A comparison of the approaches of these programs may therefore offer insight into historical changes in the epistemic values of natural history filmmakers in the BBC. In combination with these programs I have also studied articles on, and interviews with, David Attenborough who was the creator of these shows, and, as I will explain, a highly influential figure in the history of the NHU, not to mention the BBC at large and natural history filmmaking in general.

Finally I have added the blockbuster movie *Jurassic Park* (Speilberg, 1993) to my material, as well as articles and interviews related to the film, because of its influence on the production of

Walking with Dinosaurs as well as its, in some ways, parallel trajectory regarding the movement of knowledge between the scientific community, the media, and the public.

Other than the overarching public-service values of the BBC, wildlife filmmakers within the corporation have not operated under any determined set of values or written mission statements to the best of my knowledge, and so any internal culture is one which seems to have organically developed rather than having been strategically applied. Examining the statements of key figures involved in natural history filmmaking within the BBC has therefore been the most encompassing of methods applied to the material, as a way of evaluating the values and ideas which have operated within this group of filmmakers. In addition to this, however, a contributing method in interpreting the materials has been the direct analyses of some of the programs themselves. One of the consequences of the historiographical perspective accounted for by Secord is that not only texts, but also instruments and visual materials, should be considered acts of knowledge-production and communication.[27] It is perhaps in this vein which Gouyon has decided to refer to the natural history documentaries in his research as "objects of knowledge," and it is certainly in this vein which I have applied the method of directly interpreting the programs themselves as such.[28]

The "objects of knowledge" are therefore seen as equally expressive of meaning as the written statements by figures involved. Intertextual analysis between texts and the speechless elements of the television programs are thus extrapolated from this view. Considering the visual and auditory aspects of films and television programs as "textual" (i.e. part of a language of cinema), and therefore applicable to intertextual analysis, is a practice that has been applied for decades in the field of cinema and television studies.[29] I linger on this not because it is a method heavily applied in this thesis, but rather because I suspect that in the field of intellectual history it is less of a given and its occasional application here might otherwise seem assuming. As mentioned, the primary practice throughout will rather be to interpret the intentions and values of key figures involved through direct statements, both on camera and in texts. This, finally, brings us to the task at hand, which will begin with some historical context.

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[27] Secord 2004, pp. 660-661.
[28] Gouyon 2011, p. 427.
[29] Jonathan Bignell, *An Introduction to Television Studies*, 2nd ed. (London: Routledge, 2007), pp. 87-114.

2. Background

Cinema and science

From the very beginnings of the invention, cinematography was closely connected to the life sciences. In *Film, Radio and Television,* David Kirby describes how ambitions to observe the movements of animals in previously impossible ways were one of the driving factors in the technological development of the medium. In the late 1800s the scientist and physiologist Etienne Jules Marey collaborated with the inventor and photographer Eadweard Muybridge to devise new technologies that would allow for scientific research on the movement of animals. It was for example not known at the time whether or not a galloping horse's hooves ever left the ground simultaneously or not, as the motion was too fast for both the human eye and contemporary still-photography to see. Their inventions of chronophotography and moving images contributed to both the development of cinema as a medium and to the scientific study of animals in motion. Other areas of science, such as astronomy, were quick to adapt the technology, seeing its particular kind of mechanical objectivity as one capable of capturing time as opposed to still photography which was seen as objectively capturing moments and thus freezing time. The life sciences, however, took to the technology more than other sciences, as it enabled research focused on movement rather than the static, and on the living rather than studying the dead, which "paradoxically," as Kirby puts it, was the standard way to study life at the time.[30]

Moving images that were created for scientific research purposes proved to have great appeal to cinema goers as well. Cinematography was so new that the novelty of scientific images had entertainment value in its own right. Kirby refers to these early scientific films, which had been appropriated for entertainment, as "proto-science documentaries." They revealed natural phenomena to the masses without story or editing. This would soon change, primarily with the introduction of the groundbreaking documentary *Nanook of the North* (Robert Flaherty, 1922) which followed an Inuk tribe in the Canadian Arctic. Flaherty's techniques of reconstructing scenes and editing them together raised new questions of what constituted truth on camera. He himself believed that his techniques allowed him to capture truths that were otherwise

[30] Kirby 2016, pp. 428-429.

uncapturable. Many science documentarians shared Flaherty's views of the truth-revealing powers of film editing.[31] In any case his film changed film history for good and was the beginning of what we now consider to be documentary filmmaking.

Within the scientific community the advent of science documentaries caused an internal conflict. Some saw it as a powerful tool to popularize their work while others were concerned that the integrity of scientific communication would be undermined by a desire to entertain the masses. This led to attempts by scientists to "exert control over media content" which in turn caused tensions between the scientific community and media producers who were naturally interested in maintaining control over their products.[32]

From cinema to television: the BBC

Although television is a visual medium, functionally its introduction had perhaps more in common with radio than with cinema, considering it was a live broadcasting technology which provided a forum for mass communication in a different way, and on another level, than cinema ever could. Consequently it was seen as an important addition to the public service role of the BBC which had previously been exclusively a radio broadcasting corporation. As a public service corporation, the BBC had a set of values which they strived to live up to and which were crystallized in three simple words: education, information, and entertainment. The first General-Director of the BBC, John Reith, viewed the latter, however, as an "unfortunate necessity."[33] With this public service commitment, in combination with their beginnings in radio, it is perhaps not surprising that the BBC's early televised science programs, like *Serving Through Science* (1948), were not very visual at all, but essentially lectures given by scientists.[34]

This non-visual style would soon prove to be unsatisfactory to audiences, however, and producers looked for new ways to make their science-oriented shows more engaging. Wildlife programs soon became the most popular of these new attempts. The first such television show in the UK was *Zoo Quest* (1954-1963) which introduced David Attenborough to the public.

[31] Kirby 2016, p. 430.
[32] Idem, p. 428.
[33] Idem, p. 432.
[34] Idem, p. 435.

Attenborough and the Natural History Unit

In his memoirs Attenborough describes how, though he had studied geology and zoology, he decided against a career in science because, in his words: "zoological research in those days was largely laboratory-bound and that wasn't the way I wanted to study animals."[35] Instead he began working for the BBC in London, where, after a training period and some producing experience, he created the series *Zoo Quest*. As the name suggests, the program featured Attenborough, along with zoo staff, traveling to exotic locations to capture animals for the London Zoo.[36]

But Attenborough wasn't the only natural history enthusiast working within the BBC. A BBC radio producer named Desmond Hawkins who, as Attenborough puts it, "more or less invented natural history programmes on radio," made his move into television by creating the wildlife television program *Look* (1955-1969) only a year after the premiere of Zoo Quest.[37] In "The BBC Natural History Unit: Instituting Natural History Film-Making in Britain", Jean-Baptiste Gouyon describes how, in his radio programs, Hawkins, who was an ornithologist, had mostly featured amateur naturalists, and how one of his radio-famous amateurs, Peter Scott, was chosen to be the on-camera figure for *Look*.[38] Scott himself was a student of zoology, botany and physiology, but eventually decided to become a wildlife painter instead of pursuing a career in science. He did so, according to Gouyon, as "an alternative way of relating to, and producing knowledge of wild animals, in reaction against what he felt was too restrictive a view on them."[39] Scott was interested in observing animal behaviour in the wild, something which he believed academic research looked down upon, preferring to dissect and inspect dead specimens. Scott believed paintings were superior to the scientific method because they could express how the animals interacted with their environments. He also believed that paintings were more suitable for expressing movement, for example by illustrating a flock of birds all in different positions of flight. This focus on the living and the moving within complex and rich environments ment that television was a natural move. Scott's motivations to move away from science and into television were, in other words, similar to Attenborough's, who, as previously mentioned, did not believe that laboratory-bound research was the way to study animals.

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[35] Attenborough 2016, p. 10.
[36] Idem, pp. 9-46.
[37] Idem, p. 60.
[38] Gouyon 2011, p. 427.
[39] Idem, p. 428.

This emphasis by early natural history filmmakers in the BBC on escaping the restrictive aspects of a laboratory-bound approach to observing nature can be put in context with a broader historical development within the scientific community of a shift in the status of "field science". According to historians of science Robert E. Kohler and Jeremy Vetter, the term "field science" did not even come into use until the mid-1800's, as, prior to that, there was nothing unusual about doing science in nature. The practice, therefore, did not require its own moniker. As the modern sciences began to take shape, however, so did ideas and practices about working in controlled environments, which in turn led to the idea of the laboratory as the standard scientific space: "In this great spatial and epistemic reorganization, 'field' became the 'other': the not quite modern kind of science that was associated with amateur field activities and practices."[40] With this historical development in mind, it is not difficult to see how people like Scott and Attenborough, who entered into biological studies because of their passion about the natural world, found its laboratory-bound practices restrictive and reductive and subsequently aligned themselves with amateur naturalists, who were interested in studying animals within the rich contexts of their natural environments—or in "the field," as it were.

It is also easy to see why Desmond Hawkins, an ornithologist, would naturally be more inclined to place *Look* in the hands of an amateaur naturalist like Scott as opposed to a practicing zoologist who was likely to consider Desmond's relationship to nature "not quite modern". *Look* was, in any case, by no means the final destination of Hawkins' vision. He wanted to establish a special BBC unit for natural history television programs. It was to be stationed in Bristol where his radio work was based. He invited Attenborough, with whom there was an obvious kinship, to become the head of the unit, but Attenborough declined, not wanting to move from his family in London. And so, Hawkins founded, in 1957, the Natural History Unit while Attenborough became, instead, the head of the London-based Travel and Exploration Unit, from which he continued to produce Zoo Quest and other programs.[41] In the meantime *Look* became immensely popular. It featured Scott's own amateaur wildlife film material, and material from his friends which they would discuss together on the program in a talk-show setting. Gouyon describes the attractive quality of the series as giving viewers a sense that they were able to "obtain genuine and first-hand knowledge of the true essence of [...] natural phenomena."[42] In other words,

[40] Kohler & Vetter 2016, p. 282.
[41] Attenborough 2016, p. 60.
[42] Gouyon 2011, p. 431.

mechanical objectivity allowed them to acquire knowledge about the natural world experientially, rather than descriptively.

In London, Attenborough eventually moved up the ranks within the BBC and became controller for the new channel BBC2. From here he began commissioning the NHU for his programs as well as shaping the direction of the BBC's natural history programming in a direction which relied more upon scientists than amateurs. In his memoirs, Attenborough describes how scientific studies of animals had evolved into the direction that he, and other natural history filmmakers, had been pursuing. That is, in the direction of studying living animals in their environments, instead of isolated and dissected. Gouyon refers to this development as the "rise in importance and public visibility of ethology" and stresses it as an important factor in the BBC's move from amateur naturalists to scientists in the production of their natural history programs.[43] On the other hand, he also describes how the BBC was reluctant to give up its status as an independent knowledge creator and consequently privileged the importance of the filmmakers over the importance of the scientists when creating and communicating about its wildlife programs.[44] Scientists were consulted and participatory in the productions but were kept off camera as much as possible, something which Gouyon refers to as the "concealment of scientific helpers."[45]

Eventually Attenborough grew tired of administrative duties and decided to become a freelance producer. Somewhat paradoxically, it was as a freelancer that his work with the NHU really matured throughout the 1970s into a style of filmmaking and knowledge-communication which culminated in the natural history program *Life on Earth* (1979): an epic series of 13 episodes, each 55 minutes long, which displays living creatures in exoctic locations around the globe in order to describe the process of evolution. Gouyon refers to this maturation period as the "fashioning of natural history film-making into a genuine culture of knowledge-production."[46] *Life on Earth* (1979) was Attenborough's magnum opus and was presented as "the most ambitious project of its kind ever produced for television."[47] It would solidify the style, feel, and philosophy of BBC nature programs for decades to come.

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[43] Gouyon 2011, p. 432.
[44] Gouyon 2019, pp. 150-152 & 163.
[45] Gouyon 2011, p. 443.
[46] Idem, p. 439.
[47] Trailer for *Life on Earth*, in *Life on Earth* [DVD] 2003, BBC, cited in Gouyon 2011, p. 439.

The series offered a new, fresh take on nature and provided the viewers with an "overview of the natural order as a whole,"[48] something which Gouyon's use of the following quote of Attenborough's underscores:

> We were able, for instance, to put together views of living amphibians which no one had been able to see in that range of time ever. No zoo could show you that amount. The visual effect was devastating. It had the same effect on me as it did on everyone else. I remember the first time I saw the amphibian programme. I was speechless. My jaw was sagging with wonder.[49]

Driving this point home, Goyoun cites an article on Attenborough's second series *The Living Planet* (1984) in which the writer expresses that "the attempt to see things as a whole has largely been abandoned by laymen and specialists alike, but Attenborough mediates between the two."[50] The BBC had found its form of visually oriented but scientifically grounded nature programs which presented a kind of experiential and holistic knowledge that was not on offer anywhere else. Using the formula for *Life on Earth* the The BBC went on to create some of the best known natural history programs in the world: *The Living Planet* (1984), *The Trials of Life* (1990), *Life in the Freezer* (1993), *The Private Life of Plants* (1995), *The Life of Birds* (1998), and more.

Terminology

At this point it might be useful to clarify some terminology. Although Gouyon uses the words "experience" and "holistic" in order to describe the specific kind of knowledge that the BBC saw themselves as creating, he does not specifically use the terms "experiential knowledge" and "holistic knowledge" as I have done and will continue to do throughout my analysis. In this particular context I am describing experiential knowledge as a kind that can be communicated without words, and primarily through an experience of the visual and auditory senses. This stands in opposition to what I will call "descriptive knowledge" which I define as knowledge

[48] George Cuvier, quoted in Dorinda Outram, "New spaces in natural history", in Nicholas Jardine et al. (eds), Cultures of natural history (Cambridge, 1996), p. 261, Cited in Gouyon 2011, p. 439.
[49] David Attenborough, quoted in Nicholas Wapshott, "The perfect teacher, back with the animals", *The Times*, 1980-03-01, cited in Gouyon 2011, p. 439.
[50] Brain Appleyard, "Attenborough goes back to nature", *The Times,* 1984-01-19, cited in Gouyon 2011, p. 440.

attained through explanation and textual information, rather than sensory. Lastly there is the term "holistic knowledge" which in this context has nothing to do with the health-based or spirituality-related connotations of the term. It is, instead, simply defined in opposition to scientific reductionism. In other words, looking at things, as much as possible, as a whole and seeing how all the parts operate together, rather than in isolation and apart from one another.

Summary of background

So, from the very beginnings of film as a technology, the medium itself was related to and tied up with new ways of observing the natural world. The possibility of mechanical objectivity in motion brought with it new practices of focusing on the living and the moving instead of the dead and the static. Within the BBC, and from the start of the NHU, these possibilities attracted the attention of amateur naturalists who were looking for alternative, and holistic, ways of observing nature, in reaction to what they saw as a restrictive attitude in the sciences.

Eventually, however, some areas of the life sciences, like ethology, which took to the same notions as these amateurs, gained status within the scientific community. Within television, this rise of ethology changed the dynamics somewhat and scientists became more involved in the production of BBC wildlife programming. On the other hand, the filmmakers never gave up their position as independent producers of knowledge, preferring to keep the role of the scientists in the background. By 1979 this complex relationship between scientists, wildlife filmmakers and the specific attributes of the medium, culminated in a type of nature documentary filmmaking which was seen as (and which saw itself as) offering a kind of experiential and holistic knowledge that was unique.

3. Analysis

Walking with Dinosaurs: the origin story

In 1999, twenty years into the golden era of BBC wildlife programming, *Walking with Dinosaurs* burst onto the scene. Its creator, Tim Haines, had a background similar to most of the previous

key figures: he had studied zoology because of his love for natural history, but was unable to see himself as a scientist, and so he pursued a career in science journalism instead.[51] Haines' career path eventually led him to become a producer at the BBC where an opportunity struck him after seeing the feature film *Jurassic Park* (Spielberg, 1993) which had used a combination of CGI and animatronics to create realistic depictions of dinosaurs. In an interview for *SciFiNow*, Haines comments on the influence the film had on him and his work:

> After being brought up on Harryhausen[52] and rather poor animatronics, seeing the Raptor leap up through the roof was absolutely spot on. The film invented a technology and showed it to you and made you think 'gosh, you can do so much with this.'[53]

In 1996 he pitched the idea of *Walking with Dinosaurs* to executives at the BBC: it would be a series centered around the same technology that had been used for *Jurassic Park* but done in the style of a classic NHU natural history documentary, showing the lives of dinosaurs. Executives loved the idea but Haines soon realized it was far beyond the scope of a television budget and began to make plans for a show which focused more on the insects and plants of the mesozoic era and only sporadically featured small snippets of CGI dinosaurs. Eventually, however, he teamed up with animator Mike Milne whose "flexibility and imagination" in regards to CGI techniques allowed them to drastically reduce the costs, and Haines recalls: "suddenly, thanks to Mike and his team, I could have a program full of dinosaurs."[54]

The next few years were spent in production. Over 100 scientists were consulted in the making of the program.[55] In close collaboration with paleontologists, Milne's team worked on the CGI imagery while a film crew traveled the world, capturing footage for the landscapes and shooting the close-ups of the dinosaurs for which they used animatronic puppets. Plenty of research and scouting work went into these backgrounds as well. The vegetation of the mesozoic period was strikingly different from the kind we see on most of the planet today. The biggest

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[51] "Graduate Profile: Tim Haines, Producer of 'Walking with Dinosaurs'" [online video], *Bangor University*, 2013-12-12, https://www.youtube.com/watch?v=d3j7_7zRyfE&t=114s [accessed 2020-12-17].
[52] Raymond Harryhausen (1920 – 2013) was a stop motion artist who was famous for his animations of beasts and dinosaurs. He was inspired by, and an apprentice of, Willis O'Brien (1886 – 1962), the animator behind *The Lost World* (1925) and *King Kong* (1933).
[53] Tim Haines quoted in Shaun Davis, "Interview: Tim Haines", *SciFiNow*, 2009-06-01, https://www.scifinow.co.uk/blog/interview-tim-haines [retrieved 2021-01-13].
[54] Tim Haines, "Making Of", *Walking with Dinosaurs The Arena Spectacular*, [website], https://dinosaurlive.com/about/the-making-of/ [retrieved 2021-01-13].
[55] Carol Midgley, "BBC Accused over Dinosaur Series", *The Times*, 1999-10-06.

issue, in this regard, proved to be the fact that grass did not exist at the time, whereas today it is very hard to find a natural landscape without it. The behind the scenes film, *The Making of Walking With Dinosaurs* (1999) covers such details and many of the other complex processes of creating the program: the musculature of the dinosaurs, their movement patterns and behaviours, and the environmental challenges they faced, all of these factors were based on the best scientific research at the time.[56] In the field of paleontology, however, theories about behaviour, movement, as well as skin color, etc., are often just that—theories, some of them rivalrous. And so digitally solidifying these creatures necessarily meant representing a significant amount of scientific speculation as if it were objectively being observed.

The series was released in 1999. In their annual report for the year the BBC names *Walking with Dinosaurs* as one of the programs which helped them "reaffirm BBC One's role as a public service network."[57] In the same document, under a section dealing with their commercial arm—BBC Worldwide Limited—which raises extra funds for public service duties, the report claims that *Walking with Dinosaurs* became "one of the BBC's strongest-ever factual brands, generating sales of over £10 million in over 40 countries" in one year alone.[58] In other words, it was a smash hit and a public service victory. On the internet movie database IMDB.com which was already an active site in 1999, the average rating, out of over 5000 viewer ratings, is 8.5 out of 10.[59] Top reviews from viewers in the year of the release are very positive about the program, calling it things like a "brilliantly informative and visually stunning doco series" and using adjectives like "wonderful" and "breathtaking," words reminiscent of those used to describe *Life on Earth* twenty years earlier.[60] Critics loved it too. *The Washington Post* called it "an intoxicating concoction" that offers "a spine-tingling and sometimes gruesome history of the

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[56] *The Making of Walking with Dinosaurs,* BBC, 1999.
[57] Annual Report and Accounts 1999/2000, p. 10, BBC Written Archives Center (BBCWAC), available via British Online Archives (BOA), https://microform.digital/boa/collections/6/volumes/9/bbc-annual-reports-and-accounts/.
[58] Annual Report and Accounts 1999/2000, p. 52, BBCWAC.
[59] IMDB, "Walking with Dinosaurs User Ratings", *IMDB* [website], [no date], https://www.imdb.com/title/tt0214382/ratings?ref_=tt_ov_rt [retrieved 2021-01-13].
[60] IMDB, "Walking with Dinosaurs User Reviews", *IMDB* [website], [no date], https://www.imdb.com/title/tt0214382/reviews?sort=submissionDate&dir=asc&ratingFilter=0 [retrieved 2021-01-13].

legendary creatures"[61] and *The New York Times* gave the concept their stamp of approval, claiming that "the marriage of dinosaurs and nature television makes perfect sense."[62]

There were critical voices, however. Under the subtitle "The BBC Listens" the BBC's annual report reflects on the results of a "Governor's seminar with leading scientists and interested members of the public":

> Audiences need to understand clearly when items are based on fact and when they are based on speculation. It was felt that this could have been more explicitly stated in the case of Walking with Dinosaurs. The BBC will endeavour to ensure that this is clear in future programmes.[63]

On the whole, however, the program was received well, and relatively unproblematically as a nature documentary. In fact, it won several awards in categories reserved for documentary programs.[64] It is not hard to see why critical voices would have a problem with this: a fully simulated program winning awards as a documentary. In this sense the series was a strange anomaly in the filmography of the BBC, which, in the area of natural history, had spent decades cultivating a brand of knowledge-communication based on the experiential and holistic qualities of mechanical objectivity. There was not much mechanical objectivity to be found in *Walking with Dinosaurs.*

Experiential knowledge

Whether or not *Walking with Dinosaurs* was an anomaly when it was released, it clearly ceased to be one in the following years. The concept created an entirely new genre for the BBC. As with *Life on Earth*, the success of the series caused the BBC to continue creating series in the same vein: *Walking with Beasts* (2001), *Walking with Cavemen* (2003), *Sea Monsters* (2003), *Walking with Monsters* (2005), along with the one-off specials *The Ballad of Big Al* (2001), *Land of*

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[61] John Maynard, 'Dinosaurs': A Program With Bite, *Washington Post*, 2000-04-15, https://www.washingtonpost.com/archive/lifestyle/2000/04/15/dinosaurs-a-program-with-bite/4f6742e0-42fe-4f5f-8cc0-ecb5642598ca/?noredirect=on&utm_term=.0b5b80450a4d [retrieved 2021-01-13].
[62] James Gorman, COVER STORY; As They Really Might Have Been, *The New York Times*, 2000-04-16, https://www.nytimes.com/2000/04/16/tv/cover-story-as-they-really-might-have-been.html?mtrref=www.google.com [retrieved 2021-01-13].
[63] Annual Report and Accounts 1999/2000, pp. 12-13, BBCWAC.
[64] Annual Report and Accounts 1999/2000, p. 79, BBCWAC.

Giants (2002) and *The Giant Claw* (2003) were all created, using similar technologies, as part of the *Walking with Dinosaurs* franchise (which came to be known as the *Walking with…* franchise)**.** Later examples of BBC programs which were produced in the same vein include *Planet Dinosaur* (2011) and *Ice Age Giants* (2013). Clearly a new era had begun. But how much of a shift was this new genre, really, from their previous programming and what can the differences tell us about the culture and philosophy of natural history filmmaking in the BBC?

> After about 40 years of making programs about living creatures that populate our world. I wondered if I might try to make some programs about the ones that had disappeared. [...] But how can you make programs about animals and plants that no longer exist? Well I thought we'd have a go.[65]

In the context of this analysis, the quote above might easily be confused with a statement relating to *Walking with Dinosaurs*. It is, however, a quote by David Attenborough relating to the program *Lost Worlds, Vanished Lives* (1989) which was released a decade before *Walking with Dinosaurs*. *Lost Worlds, Vanished Lives* is a six part documentary series in which Attenborough departs from his usual focus on living creatures and focuses on fossils and prehistoric life. Episode three is entirely dedicated to dinosaur fossils. In 2016 the BBC released a miniseries called *Attenborough's Passion Projects*, where Attenborough presents and occasionally discusses material from some of his more unusual projects. In episode three, which is specifically about *Lost World, Vanished Lives*, he reflects on the series and discusses the approach:

> The sort of animations that we had in those days, to bring dinosaurs to life, were really rather clunky, they didn't really bring the reality, and I thought it would be a bit of a challenge, rather fun, to actually do a program about dinosaurs in which you didn't have a single reconstruction and that you tried to bring the animals to life in people's imaginations by simply looking at the bones.[66]

[65] *Attenborough's Passion Projects,* episode 3, BBC, 2016, timecode 00:50 - 01:30.
[66] Idem, timecode 31:00 - 33:00.

Attenborough is clearly passionate about fossils, referring to them as "hugely romantic".[67] Nevertheless the quote illustrates two things. His ambition was to bring the creatures behind the fossils to life and his first inclination as to how to go about that—animation—was not available to him at the time, something which he repeats in his memoirs.[68] When comparing these statements to the actual program itself, something else becomes clear as well. He did not live up to his ambition of not using "a single reconstruction" and the approach to bringing the animals to life in people's imaginations was not "simply looking at the bones."

To Attenborough's credit, however, the amount of time spent on paleontologists speaking and pointing at fossils, or himself standing next to them and speaking to the camera, must have seemed enormous in comparison to the types of programs he was used to making, which were in the business of presenting breathtaking images of wild animals and plants in their natural habitats. *Lost Worlds, Vanished Lives* does center around fossils and the scientific work done around them, but it constantly and consistently expresses a desire to visualize the creatures behind the fossils, and their habitats, in a direct and experiential manner. The introductory vignette to the series is itself an animation—or rather a combination of animation, scenography in motion, and some live shots. It is punctuated with a large fabricated dinosaur foot which steps in and out of the constructed landscape in a dramatic fashion.

Once past the vignette, and into the beginning of episode three, we are shown fossils being excavated in the field and interviews of paleontologists on the spot. Eventually we are presented with the first attempt at bringing dinosaurs to life. This first attempt does seem to fall in line with Attenborough's ambition of simply looking at bones: he stands next to large assembled fossil displays at museums and speaks to the camera.[69] These mounted museum displays are of course much more visually complete than the dusty piles of bones just shown in the field, and they do spark one's imagination to consider what these animals must have looked like in the flesh. The experience on offer here, however, is just a recording of an experience already available at museums, one which is much more striking in person than on the small screen. The frustration at the inadequacy of this is reflected in the fact that the episode soon begins cutting to dramatic

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[67] Attenborough, quoted in Kate Battersby, "David Attenborough: I'll retire if my standards begin to slip", *Radio Times*, 2018-01-07, https://www.radiotimes.com/news/tv/documentaries/2018-01-07/david-attenborough-ill-retire-if-my-standards-begin-to-slip/ [retrieved 2021-01-13].
[68] Attenborough 2016, p. 322.
[69] *Lost Worlds, Vanished Lives,* episode 3, BBC, 1989, timecode 05:00 - 07:00.

angles of such museum displays, which the filmmakers have now drenched in theatrical elements like colored lights and smoke-machine smoke, and cut together with epic music, all in an attempt to add something new and vivid—something lifelike—to the experience.[70] By "lifelike" I do not mean an attempt at verisimilitude. There is nothing realistic about dinosaurs drenched in smoke and colored lights. The effect (and intention) of these theatrical elements, however, is clearly to make the static dinosaur displays seem powerful and dangerous, to insinuate their animation, and to kindle in the viewer all of the feelings that would have naturally arisen within them if they had actually encountered one of these beasts in the flesh.

This project of bringing the dinosaurs to life is then added to by cutting to filmed shots of living animals, such as lizards and elephants, in order to help the viewer visualize things like skin texture and color.[71] And before long we are looking at painted illustrations of dinosaurs in their habitats, which have been animated simply. The dinosaur illustrations themselves remain static (their limbs don't move even if the whole animal does) but as the camera pans and travels the vegetation around the dinosaurs swoops by as if we are in a three dimensional space.[72]

Despite the challenge that Attenborough set himself, this program is nearly bursting at the seams with a desire to produce the kind of experiential knowledge about dinosaurs that his previous work with the NHU had produced about living wildlife, as well as a frustration at not being able to do so. It seems to be reluctantly stuck in a descriptive mode of communicating scientific facts and theories. It is hard to imagine that Attenborough was not acutely aware of the fact that these visuals were not of the "devastating," quality which had rendered him and the world "speechless" in *Life on Earth* (1979) a decade earlier.[73] In fact, in his memoirs Attenborough speculates that the lack of success he had with *Lost World, Vanished Lives*, in comparison to *Life on Earth,* was due to his decision to avoid the use of animation.[74]

In an interview for *Time Out*, Kate Loyd recalls an endearing moment with Attenborough, which suggests that his love for fossils is based on, or at the least accompanied by, a fascination with imagining what it would have been like to actually experience these prehistoric beasts:

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[70] *Lost Worlds, Vanished Lives*, episode 3, timecode 09:00 - 12:00.
[71] Idem, timecode 09:00 - 13:00.
[72] Idem, timecode 14:00 - 16:00.
[73] Attenborough, quoted in Wapshott, *The Times*, 1980-05-01, cited in Gouyon 2011, p. 439.
[74] Attenborough 2016, p. 323.

> ‘I would love to see a pterosaur,’ he tells me at one point. ‘They were the size of small aeroplanes.’ He opens his arms like a child pretending to fly and then says giddily: ‘How did they flap their wings? How did it get into the air?’[75]

It is telling that what Attenborough expresses is that what he would love is to see a Pterosaur in order to understand how it flaps its wings. He is not fantasizing about some paleontologist telling him how it did so. In fact, the last third of episode two of *Lost Worlds, Vanished Lives*, which is entitled *Putting Flesh on Bones,* is entirely dedicated to the scientific reconstruction of a *Pterodactyl* in the form of a remote controlled model aircraft, which is then seen soaring through the skies. A far cry from simply looking at bones. That is not to suggest that Attenborough would have wandered entirely into *Walking with Dinosaurs* territory, had he had the chance, but simply to illustrate that *Lost Worlds, Vanished Lives,* expresses a desire and a frustration at not being able to create something more experiential than it did.

In this context, *Walking with Dinosaurs* begins to look less like an anomaly, in the BBC’s natural history filmography, and more like a breakthrough which allowed them to pursue their particular brand of experiential knowledge within a popular natural history topic which had previously proved itself resistant to it. In this context, in fact, it is *Lost Worlds, Vanished Lives* which becomes the anomaly: a reluctant display of descriptive knowledge in a filmography which otherwise strives for the experiential kind.

The choice to include *Lost Worlds, Vanished Lives* in the 2016 throwback series *Attenborough’s Passion Projects* also suggest that the BBC themselves consider the show to be a deviation from their normal wildlife programming. Infact Attenborough introduces the *Passion Projects* series by saying: “I've been making natural history films for over 60 years [...] but every now and again I've been allowed to make films about my other enthusiasms [...] you could call them my passion projects.”[76] Not only is he describing *Lost Worlds, Vanished Lives* as an anomaly, he is suggesting that it is not even a natural history series, but a program about “other enthusiasms”. In an interview for *DVDtalks* in 1999, Tim Haines echoes this notion, that there is a clear distinction between a documentary about paleontology and what he considers to be a true natural history film:

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[75] Attenborough, quoted in Kate Lloyd, "The Big Interview", *Time Out*, date unspecified, https://www.timeout.com/london/the-big-interview-sir-david-attenborough [retrieved 2021-02-13].
[76] *Attenborough’s Passion Projects,* episode 1, BBC, 2016.

> As I looked at covering dinosaurs I decided that I wanted to find a new way of tackling paleontology. To that end we decided to go down a route that wasn't so much paleontological but more natural history in an attempt to provide some kind of a new experience for people.[77]

It is also interesting to note that despite the fact that *Lost Worlds, Vanished Lives* touches on nearly all of the same scientific research that *Walking with Dinosaurs* does, Tim Haines makes no mention of *Lost Worlds, Vanished Lives* as an inspiration but expresses instead that he "was more interested in making the next *Life on Earth* than anything else."[78] In other words, he wanted to create something "breathtaking" and "devastating", not something descriptive. The connection to *Life on Earth* rather than *Lost Worlds, Vanished Lives,* was made on the receiving end as well, *The Guardian*, for example stating that, watching *Walking with Dinosaurs* was "just like watching a Triassic version of Life on Earth."[79] This ambition of Haines' is reinforced again by the BBC itself in the way it introduces *Walking with Dinosaurs* on the current *Walking with Dinosaurs* webpage on the BBC's website. The program is described as having used "computer-generated imagery and animatronics" in order to avoid "the use of 'talking head' interviews".[80] The development of CGI had, in other words, enabled the BBC to avoid creating descriptive documentaries in the field of paleontology and finally allowed them to create the experiential kind. Films about prehistoric creatures no longer needed to be anomalous to the particular brand of knowledge-production that they had carved out for themselves in natural history programming.

This description of the historical facts has broader implications as well. If it is the relatively descriptive-oriented *Lost Worlds, Vanished Lives*, that is considered by the BBC to be the epistemic anomaly because it does not fall in line with their own unique knowledge-producing qualities, then the BBC cannot be said to be engaging in a linear model of knowledge-communication which repackages established science for the public. This problematization of the linear model echoes the critique in *Den mediala vetenskapen* which

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[77] Haines, quoted in DVDtalk, "Talking with Tim Haines", *DVDtalk*, 1999, https://www.dvdtalk.com/interviews/tim_haines_walk.html [retrieved 2021-01-13].
[78] Haines, quoted in Davis, *SciFiNow*, 2009-06-01,
[79] Robin McKie, "Who put the pee in the postosuchus?", *The Guardian*, 1999-03-01, https://www.theguardian.com/uk/1999/oct/10/robinmckie.theobserver [retrieved 2021-01-13].
[80] BBC, "Walking with Dinosaurs Original Series", *BBC Earth* [website], [no date], https://www.bbcearth.com/walking-with-dinosaurs/ [retrieved 2021-01-13].

describes similar historical developments in other media. In one of the anthology's historical accounts, for example, entitled "Känn dig själv! Om vaxkabinett och anatomiska utställningar", Eva Åhrén Snickare describes the history of wax museums, which had their heyday around the turn of the 1900s, and how this history compares to the professional anatomical museums used by scientists at the time for research and education.[81] She notes how wax museums might be considered popular science, as they displayed representations of anatomical parts and would show spectacular things like dissected bodies and inner organs in realistic and entertaining ways. Snickare describes, however, how these wax museums were, in fact, driven by their own autonomous goals and values, offering the public the ability to "know" themselves by way of direct, realistic experiences of the inner-workings of human anatomies. In opposition to the "systematized knowledge and aesthetics" of the scientific anatomical museums, which presented their objects out of context, with organs separated from their bodies and organized by type, the wax museums created contextual experiences and insisted that "observing the inner human body is interesting in its own right" as well as an experience which has "existential" qualities.[82]

Holistic knowledge

Walking with Dinosaurs, then, was seen by the BBC not as a failure to communicate scientific facts but as a triumph in creating their own particular brand of knowledge on the topic of prehistoric life. But was the series really engaging in knowledge production? Basing itself on simulation rather than mechanical objectivity would seemingly mean any notion of capturing the hitherto unseen would be out of its grasp. In the direct sense, of course, this is true. There is no mechanical objectivity in *Walking with Dinosaurs* when it comes to the walking, moving dinosaurs. These animations are visual amalgamations of various areas of preexisting knowledge; this sounds more like a form of communication than creation. The filmmakers, however, would disagree. Many of the paleontologists would as well. There is a telling line in the narration of *The Making of Walking with Dinosaurs* which underscores the notion that for the BBC, *Walking with Dinosaurs* was continuing the tradition of natural history films that, at least

[81] Eva Åhrén Snickare, "Känn dig själv! Om vaxkabinett och anatomiska utställningar", in Ekström (ed.) 2004, pp. 59-82.
[82] Snickare 2004, p. 82.

in part, *produced* knowledge rather than simply translated scientific facts to the audience. In speaking of the experts who were consulted for the show the narrator exclaims that "in the process, even the paleontologists were learning a thing or two." Paleontologist Dr. David Newman is then seen speaking on screen:

> Working with the animators and the designers, I was able to see my skeletal reconstructions changed into something more like a dynamic animal moving. By doing that I had to think very seriously about the dynamics of the joints, the way the bones moved relative to one another. That's the critical difference that these animations provide for us and that brings the animals more to life than I had appreciated.[83]

Paleontologist Kent Stevens then echoes the sentiment:

> The filmmakers, in making computer models and physical models, have been actually teaching the paleontologist some things. They've been showing us what works and what doesn't work, and I've been delighted to see that information is actually flowing both directions.[84]

The ambition to create an experiential documentary about dinosaurs rather than a descriptive one, drove the filmmakers to collect vast amounts of information and fuse it together into plausible moving animations. This process seems to have brought them upon another aspect of knowledge production which Gouyon also describes as specific to earlier BBC natural history productions, and which is related to the experiential type, and that is the aspect of holistic knowledge. Scientific research often requires disassembling and categorizing a phenomenon into many small elements and analyzing these elements in isolation from one another. This, of course, has its benefits as it allows scientists to create knowledge about complex phenomena in a piecemeal manner, working away bit by bit. The problem with this process of categorized knowledge is that it is missing the holistic element. Something new, something which perhaps isn't present in the small pieces, becomes apparent when these pieces are interacting as a whole.

Paleontologists understand this of course, which is why making models and paintings, based on their research, is an important end goal of their process. But fully animated three dimensional creatures interacting with their environments was not something they had ever recreated. The

[83] *The Making of Walking with Dinosaurs*, timecode 23:00 - 23:30.
[84] Idem, timecode 23:30 - 23:50.

paleontologists in the *Making of Walking with Dinosaurs* film seem to be suggesting that the filmmakers' ambition to create something truly experiential pushed the scientists further down a holistic path than they had previously been and forced them to consider the interaction of all this information at deeper levels then they had previously done. In a paper which was written a year after the series' release, paleontologist and professor, Michael James Benton, who also served as an advisor to the series, seems to agree with this sentiment:

> I believe that WWD, far from being merely a media event, is actually a powerful piece of palaeobiological research. [...] Moving dinosaurs are a natural end-point of the palaeontological endeavour. [...] No palaeontologist can afford to pay for computer animation. So, in my view, the BBC has done the palaeontological world a marvellous service, in presenting a multi-million-pound research grant to help us do this work.[85]

There is a difference of course between what is being described here and the kind of holistic knowledge expressed in earlier BBC productions. In a 2010 interview, looking back on his career, Attenborough reflects on the holistic aspects of his work, seeing them as contributing to the fact that *Life on Earth* was perceived as a "mini-revolution":

> for the first time, it was possible to fly anywhere in the world more or less reliably. [...] The fact that we moved from the Sahara desert to the coral reefs of Australia mid-sentence caused a public sensation. It created the novel impression that you could see the Earth as a globe, as the world itself, for the first time.[86]

While the focus here is on the aspect of experiencing the globe as a whole, there is a parallel to the way in which the making of *Walking with Dinosaurs* helped the scientists involved see things in a new holistic light. The difference being that this was an internal process rather than external as in the case of *Life on Earth*. In any case, it is clear that the scientists involved in *Walking with Dinosaurs,* considered the program to have actual knowledge-producing qualities.

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[85] Michael J. Benton, "The science of 'Walking with Dinosaurs'", *Teaching Earth Sciences* 26.1 (2001), pp. 8-9.
[86] Attenborough, quoted in Bienvenido León, "Interview with David Attenborough", *Mètode*, 2010-07-21, https://metode.org/issues/monographs/david-attenborough-3.html [retrieved 2021-01-13].

Circulating knowledge

Despite this, Benton is still critical about the lack of separation between fact and speculation in the final product. Not because he believes the series was hiding vast amounts of speculation, but because the lack of clarity led some people to suspect it was. A suspicion which in turn diminished their appreciation for the very good work which had gone into the program.[87] On the other hand, Benton believes that even this criticism has had a great educational effect, stating that "the cynicism, linked to amazement at the visual impact of the programmes, readily turns into questions: how do you know that?" This inquisitiveness, generated by the series, has, in his experience, sparked the interest of "a huge new group of people."[88] His public appearances were now attracting up to 400 people at a time, rather than the usual 50. This notion, of skepticism acting as instigator for inquisitiveness, is shared by the program's creator, Tim Haines:

> It's exactly what Walking With Dinosaurs was meant to do: turn people on to the subject, then if they ask the question "how do we know all that stuff" that's great, I'll send them to a museum and they'll find out or they'll go to books and find out more.[89]

Both Haines and Benton here are expressing something which follows in the tradition of earlier BBC wildlife programs and their creators. When Attenborough was questioned about the challenges of conveying science through television he gave the following answer:

> If you're reading a book about a complex scientific question, you can read a passage over again until you understand it. But on television that is not possible. Therefore, you either set a very elementary educational level, or ensure that the TV makes a scientific issue so interesting that the viewer says afterwards «ok, I'm going to look for a book on that topic». Therefore, the television sparks the enthusiasm to discover something, which books will have to satisfy.[90]

There is a difference, of course, to Attenborough's response. What "sparks the enthusiasm to discover something" for him, is not so much scepticism in combination with engaging material, but rather a cursory rendering of a scientific issue in combination with engaging material.

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[87] Benton 2001, p. 5.
[88] Ibid.
[89] Haines, quoted in DVDtalk, *DVDtalk* 1999.
[90] Attenborough, quoted in León, *Mètode* 2010-07-21.

Nevertheless, both of these natural history filmmakers see themselves as occupying a crucial role in the public circulation of knowledge. Information is not simply collected from scientists and communicated to the public, but there is an active movement between these three actors, and these program creators have a clear view of their role in this process. They want to base their productions on solid scientific work but also to create something which the scientific work lacks: an experience which captures and engages the public in a direct manner. On the other hand, what these holistic experiences lack is a focus on detail and information. This, however, is not seen by the filmmakers as a failure on their part, because they believe that they are engaging people in a way that might, in turn, prompt them to seek out more descriptive types of knowledge.

In an article in the Washington Post, Matthew Mossbrucker, director and chief curator of the Morrison Natural History Museum, makes a similar case about the criticism sparked by scientific inaccuracies in *Jurassic Park*. The fact that visitors would ask questions like "would a T. Rex really not see you if you stood perfectly still," was by no means a negative one to Mossbrucker who was experiencing a level of interest in his field which he had never previously seen: "It was wonderful" he exclaims, "these are opportunities to have people ask great questions and to educate them — not excuses to throw popcorn at the screen."[91]

Public discussions of knowledge

The effects of *Walking with Dinosaurs* and *Jurassic Park* on the ways in which scientific knowledge circulates are similar in more ways than one. All sciences have to engage in a certain amount of speculation, although perhaps paleontology more so than many others, considering that the lives it examines are long since extinct. In any case, speculations at the edges of what is known mean that there will be competing theories within a field at any given time. One of the novel aspects of *Walking with Dinosaurs* is that it, as a documentary, engaged in something which science-fiction films often do. It picked certain scientific speculations over others and digitally solidified them in visual and narrative representations. As the original BBC website put it, "they encountered a huge range of conflicting scientific opinions" and so "a consensus had to

[91] Matthew Mossbrucker, quoted in Rachel Feltman & Abby Ohlheiser, "Why paleontologists love the noisy, featherless, inaccurate dinosaurs of 'Jurassic Park'", *The Washington Post*, 2015-06-13, https://www.washingtonpost.com/news/speaking-of-science/wp/2015/06/13/why-paleontologists-love-jurassic-parks-noisy-featherless-inaccurate-dinosaurs/ [retrieved 2021-01-13].

be reached based on the theories with the most evidence to support them."[92] The effect of this aspect of *Walking with Dinosaurs* in the public sphere was also similar to the effect that such visualizations in fiction often cause. It created a public discussion of the science behind the scenes, something which the BBC encouraged.[93] A fairly recent example of such an effect in fiction is Christopher Nolan's 2014 blockbuster *Interstellar* which visualized and narrativized the physics of black holes in new and innovative ways. Physics, perhaps more so than paleontology, is a field with many competing theories, and the decisions made by Nolan, in tight collaboration with the physicist Kip Thorn, caused a wave of articles, forums and videos, discussing what was speculation and what was fact, and in the process making the unfinished business of physics a public discussion.[94] Despite the fact that *Jurassic Park* was released in 1993 the public conversations around its use of scientific speculations are still ongoing today. They now often take on a historical aspect as well, discussing the ways in which the scientific theories have evolved and changed over the years.[95] For example, the fact that many dinosaur species are now thought to have been feathered.

In the case of *Walking with Dinosaurs* the producers themselves engaged in creating such a public discussion through the accompanying *Making of Walking with Dinosaurs* film which

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[92] BBC, "The Making of Production", *BBC* [website], 2000, obsolete but accessed via *The Wayback Machine* [internet archive website] https://web.archive.org/web/20010913042332/http://www.bbc.co.uk/dinosaurs/tv_series/making_of.shtml [retrieved 2021-01-13].

[93] BBC, "Live Chat - Transcript", *BBC* [website], 2000, obsolete but accessed via *The Wayback Machine* [internet archive website] https://web.archive.org/web/20010913042335/http://www.bbc.co.uk/dinosaurs/tv_series/chat_trans.shtml [retrieved 2021-01-13].

[94] See for example: Jeffrey Kluger, "What Interstellar Got Right and Wrong About Science", *Time*, 2014-11-07, https://time.com/3572988/interstellar-science-fact-check/ [retrieved 2021-01-13], and: Adam Rogers, "Wrinkles in Spacetime: the Warped Astrophysics of Interstellar", *Wired*, 2014-10, https://www.wired.com/2014/10/astrophysics-interstellar-black-hole/ [retrieved 2021-01-13], and: "The Science of Interstellar: an Illustration of a Century of Relativity with Kip Thorne" [online video], *Science & Cocktails*, 2015-12-18, https://www.youtube.com/watch?v=lM-N0tbwBB4 [accessed 2020-12-26].

[95] See for example: Olivia B. Waxman, "The Real Scientific History Behind the Jurassic Park Dinosaurs", *Time*, 2018-06-22, https://time.com/5313949/real-dinosaurs-jurassic-world-fallen-kingdom-jurassic-park-fact-check-checking-history/ [retrieved 2021-01-13]; Sarah Sloat, "The science of Jurassic", *Pacific Standard*, 2017-06-14, https://psmag.com/social-justice/science-jurassic-park-66396 [retrieved 2021-01-13]; Michael Dhar, "T. Rex at 20: How 'Jurassic Park' Science Has Evolved", *Live Science*, 2013-06-10, https://www.livescience.com/37297-science-of-jurassic-park-evolved.html [retrieved 2021-01-13]; John Pickrell, "'Jurassic Park' got almost everything wrong about this iconic dinosaur", *National Geographic*, 2020-07-07, https://www.nationalgeographic.com/science/2020/07/jurassic-park-got-almost-everything-wrong-about-iconic-dinosaur-dilophosaurus/ [retrieved 2021-01-13].

discussed the various speculative areas of paleontological theories behind the final decisions of the filmmakers. The *Torosaurus*, for example, had a giant shield-like crest on its head which paleontologists have assumed to be a defensive structure. In the making-of film, paleontologist Peter Dodson explains why that theory is unlikely to be true and instead presents his own speculative theory. Dodson believes that the crests were colorful sexual displays used by males to accentuate their prowess and attract mating partners while locking horns with other males, an idea which the animators based their visuals on in the final product.[96] Such executive scientific decisions, taken by the filmmakers to represent certain speculations as if they were established, was the focal point of the criticism which surrounded the show. The media's coverage of this criticism continued the discussion of unfinished paleontological business but also covered the broader issue of whether or not science and representations of science should be about laying down the law or about thinking out loud. Critics were, of course, adamant that the program should not have visualized things that were speculative.[97] In defending the series, however, Benton is quoted by *The Guardian* as saying that "science is about taking risks, making hypotheses, rather than about certainties".[98]

This practice of bringing forth the value of scientific hypotheses and speculations, rather than simply communicating certainties, was a move which wildlife programs in the BBC had pioneered decades earlier. Gouyon's research shows how, during his position as Controller of BBC2, Attenborough deliberately cultivated such a practice with his new series *Life in the Animal World* (BBC, 1965-1968), which was envisioned as a new take on Peter Scott's *Look.* With *Life in the Animal World,* Attenborough not only wanted to replace the use of amateur naturalists with that of scientists, for reasons already discussed, but he also wanted to have his scientists think, discuss and doubt, instead of state with certainty how things were, as he felt the naturalists had done.[99] In Gouyon's phrasing Attenborough was providing the means for "viewers to witness and share in the process of knowledge production."[100]

Gouyon's research also indicates, however, that this practice developed within the BBC and the NHU, to an extent, and in a direction, which Attenborough himself might not have been comfortable with. In the pre-production period of *Life on Earth,* about a decade after the

[96] *The Making of Walking with Dinosaurs*.
[97] Midgley, *The Times* 1999-10-06.
[98] Benton, quoted in Midgley, *The Times* 1999-10-06.
[99] Gouyon 2019, pp. 125-143.
[100] Idem, p. 136.

premiere of *Life in the Animal World*, memos between key figures involved reveal a critical view of Attenborough's early drafts of the program's script. The memos express frustration at the fact that Attenborough was insisting on relying on text-book scientific knowledge for his script, something which they believed was hampering the show's ability to bring to bear the full potential of what the NHU's original voice might be like. The head of the NHU at the time, Mike Rhodes, along with the new controller of BBC2, Aubrey Singer, as well as producers at the NHU, wanted to venture further into scientific uncertainties, and to establish the BBC as, what Gouyon refers to as, an "arbiter in scientific debates," between "scientists' competing claims to knowledge."[101] This ambition was in line with the BBC's broader view of television's capability of making "original statements about the world."[102] Gouyon cites Aubrey Singer, then the head of Science and Features:

> There are times when television acts in its own right, … when it uses its power of communication not merely to convey other people's images but rather to create out of its potentialities its own genuine statements. When we do we can claim equal responsibility with [...] architects, authors, scientists, [...] with all those who create and communicate original work.[103]

Although Attenborough had himself been active in pulling back the curtain between scientific work and the public, he did not seem inclined to take it in the direction that others within the organization did: to not only reveal the ongoings of scientific theorizing and speculation, but also to assert themselves as arbiters in scientific debates and to make their own original statements about the world.

Again, this complication of the linear model echoes the conclusions of *Den Mediala Vetenskapen*. In the chapter, entitled "Nils Ekholm, stormvarningarna och allmänheten", Gustav Holmberg covers the work of meteorologist, Nils Ekholm, and his development of a system for storm-warnings in early twentieth-century Sweden. Not only did Ekholm actively engage with the media and use it as a political tool to further his career and his specific scientific theories, but when his ideas were challenged by the astronomer Gustaf Strömberg, the daily paper Dagens Nyheter, who by this time were enamoured with Ekholm, invited their readers to act as arbiters

[101] Gouyon 2019, p. 218-219.
[102] Idem, p. 219.
[103] Aubrey Singer, "Television: Window on culture or reflection in the glass?", *The American Scholar* 35.2 (1966), pp. 303-309, cited in Gouyon 2019, pp. 220-221.

in this scientific debate. For three months they conducted what they called an "experiment" by publishing reflections about the accuracy of Strömbergs forecasts and concluding in a summarizing piece that they lacked substance.[104] Strömberg was forced to retreat back into the field of astronomy.

Once again, *Walking with Dinosaurs* looks less like an anomaly and more like a natural step in a progression that had been underway for decades within the BBC: on the one hand, *Walking with Dinosaurs* expresses its own statements about the natural world by making executive decisions as to which speculations its visualizations embody, on the other hand, through its making-of film, and through the public discussions it instigated, it presents science as an ongoing discussion rather than merely a place to extract established truths. The fact that there are seemingly no direct comments by Attenborough on *Walking with Dinosaurs* anywhere to be found, despite it having been produced by the BBC and its creator citing Attenborough's *Life on Earth* as its inspiration, could suggest that Attenborough himself is reluctant to comment on the program because he views it as a continuation of the progression within the BBC which he resisted. In his memoirs, in any case, Attenborough does make an indirect comment when he speaks of "electronic images of creatures," in a context which clearly implies *Walking with Dinosaurs*:

> Computer experts [...] became so ingenious that they could create totally convincing electronic images of creatures that do not exist. So people, first in the cinema and then in their television sets at home, watched dinosaurs moving, running, urinating and tearing one another to bits. Viewers could have every reason to be baffled. What is true and what is false? Since anything can be invented, why believe that anything is real? In this situation it seemed to me that a presenter might now have a new and additional function. Many of the things he talked about were, after all, quite difficult to credit. Are there really such things as snakes that fly, fish that walk, or frogs that incubate their tadpoles in their stomachs — or are images of such things merely created by a computer programer because someone believes that they do? If a presenter is known and trusted, viewers might accept that what he says and shows is indeed an actuality. But if viewers are to continue to believe him, he has to guard his reputation for sincerity.[105]

[104] Gustav Holmberg, "Nils Ekholm, stormvarningarna och allmänheten", in Ekström (ed.) 2004, pp. 99-103.
[105] Attenborough 2016, p. 341.

In comparison with previous comments by Attenborough on the use of animation, this quote allows us to get a clearer view of the reasoning behind his unwillingness to move in the direction which others within the BBC were pushing towards. In discussing *Lost Worlds, Vanished lives,* Attenborough had expressed a desire to use animation but also explained how he decided against it because the techniques of the time were not convincing enough. Now he explains that, despite the experiential values and benefits of *convincing* constructed images in natural history areas where such images cannot be created through mechanical objectivity, the use of them risks degrading another important aspect of the BBC's natural history programs: the trustworthiness of the presenter. Attenborough's "reputation" as he puts it, was something which he had developed over decades, and which he, understandably so, was concerned about tarnishing. On the other hand, Attenborough does seem interested in the use of convincing animation, just not at the expense of his trustworthiness.

There is, in fact, a program which gives an answer to what *Lost Worlds, Vanished Lives* might have looked like had Attenborough had access to CGI technology at the time. In 2016 he wrote and starred as presenter in the BBC production *Attenborough and the Giant Dinosaur* which follows the paleontological work surrounding a giant dinosaur fossil.[106] Although the show centers around the actual fossil and the paleontologists who worked on it, it is punctuated by recurring scenes in which the dinosaur is fully visualized with the use of CGI technology, and Attenborough, as presenter, stands in front of it, seemingly existing in its space—an approach which he had, infact, applied six years prior to *Attenborough and the Giant Dinosaur*, in a two-part mini-series entitled *First Life* (BBC 2010). The series uses CGI to bring to life the first marine animals, which had evolved from single cell organisms over 500 million years ago. As with *Attenborough and the Giant Dinosaur*, a large portion of the content is descriptive, consisting of interviews with scientists and footage of fossils, while CGI reconstructions punctuate the narrative with experiential sequences, which he describes in his memoirs, once again, as "breathtaking".[107] The show begins with a brief introduction where Attenborough explains, on-camera, that he will be travelling "back in time to try and build a picture of what life was like," before his narration switches to a voice-over exclaiming that "in fifty years of program-making I've been lucky enough to explore the living world in all its splendor and

[106] *Attenborough and the Giant Dinosaur*, BBC, 2016.
[107] Attenborough 2016, p. 422.

complexity".[108] The program then cuts to a nostalgic sequence of shots and short clips from his earlier productions, all set to a swelling and nostalgic soundtrack. The reliance here on Attenborough's reputation, in giving weight to the simulated experiential content, is evident. The main difference, then, between Attenborough and other natural history filmmakers within the BBC, is one of degree. Just as scientists in the early 20th century had been concerned that the reconstructions and editing in early wildlife films (which Attenborough eventually came to represent) would devalue the credibility of their own filmed imagery and their claims to mechanical objectivity which were based on the imagery's raw and unedited state, Attenborough was now concerned that his colleagues, moving further in the direction of prioritizing experiential knowledge over mechanical objectivity, were degrading his trustworthiness in the realm of knowledge communication and production.

This difference of balance seems also to go hand in hand with the notion of creating original statements. Both parties within the BBC value the notion of providing the means for "viewers to witness and share in the process of knowledge production" by revealing science as a process of competing theories and hypotheses. In areas where mechanical objectivity is not available, however, like programs about dinosaurs, Attenborough prefers to reveal this aspect of science through the use of descriptive knowledge by showing scientists explaining and discussing their theories and speculations because he believes that doing so will allow the complementary experiential knowledge that he provides through the accompanying "breathtaking" CGI imagery to remain unquestioned and believable. Others, within the BBC, however, are more keen to create original statements by making executive decisions as to which speculations to visualise through CGI while containing the use of descriptive knowledge pertaining to the unfinished nature of science to the surrounding media, such as the making-of films and the public discussions caused by their materials.

One might say that just as science has a front end (presenting established facts) and a back end (the process of theorizing and speculation which goes into creating established facts), natural history filmmakers in the BBC, including Attenborough in cases where mechanical objectivity is available, like to have a front end (the presentation of their experiential original statement in its unquestioned form) and a back end (the behind the scenes material which discusses the theories and speculation behind the final product). Attenborough's approach when it comes to programs

[108] *First Life,* BBC, 2010, timecode 00.00 - 01.30.

about prehistoric creatures, on the other hand, is to combine the representation of the "front end" and the "back end" into a single product: an amalgamation of experiential and descriptive knowledge, which preserves the credibility of the presenter at all times.

Full circle

The ways in which both *Jurassic Park* and *Walking with Dinosaurs* created a public discussion of the speculative aspects of paleontology, suggest that at one level the effect of these productions should be talked about as one and the same, despite the one being pure fiction and the other presenting itself as a documentary. So many of the involved parties commenting on *Walking with Dinosaurs,* from its creator, Tim Haines, to journalists and the viewers, seem to talk of the two in the same breath. Even Attenborough, in an indirect way, does so in the quote above, when he comments on how "people, first in the cinema and then in their television sets at home, watched dinosaurs moving". When it comes to the aspect of whether or not the circulation of knowledge involved in the production of these moving images ever came back around to the field of paleontology which informed it, this seems to be a valuable approach, considering that the cultural impact of *Jurassic Park* was much larger than that of *Walking with Dinosaurs,* and in a way *Walking with Dinosaurs* was itself part of the cultural effect of *Jurassic Park*, as evidenced by Haines' own description of his idea for the show.

We have already described how some paleontologists, such as Benton and others involved in the production of *Walking with Dinosaurs,* believe that the production of the show actually helped them produce knowledge in their field. There is another aspect as well, however, to the influence *Walking with Dinosaurs* had on the field of Paleontology, and that is the indirect effect of inspiring young minds to join the field. In an article in *The Daily Record* entitled "Edinburgh scientist tells how BBC's Walking with Dinosaurs inspired him into career in paleontology," paleontologist Steve Brusatte, who was an advisor for the feature film spin-off of the series, named the original program as the reason he pursued the career in the first place.[109] Brusatte mentions *Jurassic Park* as an influence too, although he describes its portrayal of dinosaurs as

[109] Brian McIver, "Edinburgh scientist tells how BBC's Walking with Dinosaurs inspired him into career in paleontology", *The Daily Record*, 2014-04-28, https://www.dailyrecord.co.uk/news/scottish-news/edinburgh-scientist-tells-how-bbcs-3468979 [retrieved 2021-01-13]

less accurate: "I loved Jurassic Park, and the effects were incredible, but it was a monster movie and they exaggerated the size of the dinosaurs for the story."[110] Despite the less accurate attributes of its dinosaurs, the global impact of *Jurassic Park* should not be underestimated when it comes to inspiring people to join the field, and in creating an excitement around the science which in turn created an influx of finances into various aspects of paleontological work. In an article in *The Guardian*, entitled "How Jurassic Park ushered in a golden age of dinosaurs," Brusatte claims that "Jurassic Park played a huge and under-appreciated role in the transformation of palaeontology that we are now witnessing."[111] Professor Benton is quoted in the same article as saying that when he asks his students "what factor was the main influence in their decision to study dinosaurs. Jurassic Park gets the biggest show of hands."[112] Speaking of *Jurassic Park* to The Verge, in another article, Brusatte says that:

> It reignited this interest in dinosaurs, and that led directly to a lot of museums putting out dinosaur exhibits. A lot of universities put out courses, and [there was] a lot more interest and money in the field. A lot of my colleagues got jobs specifically because of Jurassic Park, because a museum or university wanted to hire a paleontologist after that. So I do think there is a really, really good chance I wouldn't have my job today [...] if the movie was never made. [...] The film changed the whole potential of the field, and we're reaping the benefits of that because there are so many people of my generation all around the world that were so enthused by the film.[113]

In a *Washington Post* article Matthew Mossbrucker, director and chief curator of the Morrison Natural History Museum, claims that the "wonderful explosion in interest" after *Jurassic Park* was "partially responsible" for giving him a career. In the same article paleontologist Matthew Carrano is quoted as saying, if "you're a young paleontologist, and you have a job, the movies have some part in that, frankly. [...] None of these museums had a dinosaur paleontologist in 1985. And now they all do."[114]

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[110] Brian McIver, *The Daily Record*, 2014-04-28.
[111] Steve Brusatte, quoted in Robin McKie, "How Jurassic Park ushered in a golden age of dinosaurs", *The Daily Record*, 2014-04-28,https://www.theguardian.com/science/2018/dec/23/jurassic-park-film-inspires-new-era-of-dinosaur-discoveries [retrieved 2021-01-13].
[112] Benton, quoted in McKie, *The Daily Record* 2014-04-28.
[113] Brusatte, quoted in Andrew Liptak, "How Jurassic Park led to the modernization of dinosaur paleontology", *The Daily Record*, 2018-06-23, https://www.theverge.com/2018/6/23/17483340/jurassic-park-world-steve-brusatte-the-rise-and-fall-of-the-dinosaurs-book-interview-paleontology [retrieved 2021-01-13].
[114] Mathew Mossbrucker, quoted in Feltman & Ohlheiser, *The Washington Post*, 2015-06-13.

Although the research which would be needed to establish these references as fact is beyond the scopes of this thesis, it can at least be said that there is a perception within the field of paleontology that both *Walking with Dinosaurs* and *Jurassic Park* caused an increase in the amount of people entering into the field as well as a general financial influx. What's more, in 2013, the Society of Vertebrate Paleontology officially honored the director of *Jurassic Park,* Steven Spielberg, for his contributions to the field, something which Time magazine put forward as "proof that the franchise has earned the respect of paleontologists."[115]

4. Closing

Focused conclusion

Whereas Bagust concedes that the British tradition, which he sees as culminating with *Life on Earth*, was not as manipulative as the American, but more in line with the "village 'nature rambler' and observer," he, nevertheless, compares *Walking with Dinosaurs* to the American tradition since he views the series as a product of globalized markets. He thus considers *Walking with Dinosaurs* to not only be a break from its own institutional history but also the result of producers, under the pressure of global markets, aiming their content at postmodern, gaming-savvy, consumers who have come to expect their media to be riddled with special effects. Seeing things in a similar light, Darely describes *Walking with Dinosaurs* as a "significant shift" towards natural history filmmaking which is essentially "aesthetic" rather than factual, also as a consequence of globalized markets. A closer look into the intentions espoused by the creators themselves, however, reveals that the ambition of *Walking with Dinosaurs* was by no means to break from a tradition represented by *Life on Earth*, but precisely the opposite: their ambition was to create "the next *Life on Earth*." Furthermore, the use of CGI is described by Haines as a means of continuing in the experiential tradition of *Life on Earth,* rather than a marketing ploy.

A closer look at what Bagust rather aptly describes as the "village 'nature rambler' and observer" ethos of the British tradition, reveals that this tradition was established by nature

[115] Waxman, *Time*, 2018-06-22.

enthusiasts who, disillusioned with laboratory-centric practices of zoology at the time, had moved into television as a kind of alternative "field science." This enabled them, at least to some degree, to make their own "original statements" about the natural world and to offer experiential and holistic "objects of knowledge" which were unique and separate from scientific output. This unique brand of knowledge-production, however, was never a good match for films about creatures who have been extinct for millions of years, because there are no animals to create experiential and holistic knowledge about through mechanical objectivity. The only things to observe in this case are paleontologists and fossils. The frustration of this mismatch is evident in Attenborough's previous attempt to tackle the subject in *Lost Worlds, Vanished Lives*.

With *Walking with Dinosaurs*, however, Tim Haines found in *Jurassic Park* a way to conquer this previously resilient natural history territory by using simulations. Now the BBC was finally able to "avoid the use of talking heads" and make their own original statements about prehistoric life by digitally solidifying paleontological theories and speculations into objects of experiential and holistic knowledge. Programs about dinosaurs, and other long-extinct species, no longer had to be epistemic anomalies within the BBC's filmography but could continue in the lineage of *Life on Earth* and other Attenborough classics. Post-Walking-with-Dinosaurs productions like *Attenborough and the Giant Dinosaur*, and others like it, reveal that Attenborough himself is keen to take advantage of these new technologies and their capabilities of producing experiential knowledge of extinct animals. His approach, however, is more careful, opting to blend such simulations with the "talking heads" of paleontologists in order to maintain the public's trust in himself as a presenter. In other words, the lack of mechanical objectivity itself does not seem to be a major concern for Attenborough but rather the reputational problems it might cause. Such reputational concerns were, of course, not an issue for Tim Haines who had no such public image to attend to. In any case it seems that mechanical objectivity was never really a foundational epistemic value for natural history filmmakers in the BBC but rather a means to an end. That end being an alternative, holistic and experiential view of nature.

If *Walking with Dinosaurs* does represent a break from its own institutional history in a significant way (other than the application of CGI technologies which were not previously available) it would seem to be a break related to this specific difference of degree in Attenborough's approach, which can be seen as a continuation of a historical tension between him and others within the organization who considered him to be too reluctant to make original

statements about nature. As mentioned, this itself was not a tension based on a difference of kind but rather of degree. Attenborough himself had been a pioneer of such an approach but was reluctant to take it as far as others. *Walking with Dinosaurs* can be seen, in this light, as a new generation's amplification of the approach of its progenitors, to a degree which might be causing some paternal discomfort.

Even the cause of this discomfort, however, is seen by the creators of *Walking with Dinosaurs* as having the same effect on viewers that Attenborough considers his programs to have. Rather than being a weakness, both Attenborough and Haines consider the deficiencies implicit in the objects of experiential knowledge that they create to be positive in the sense that they are cause for viewers to seek out more descriptive sources of knowledge on the subjects in question. For Attenborough it was the "cursory" nature of his programs which caused this, whereas for Haines it was the fact that *Walking with Dinosaurs* simulated certain speculative theories over others, instead of openly discussing them, which caused questions in the viewers' minds. On the other hand, the original statement of *Walking with Dinosaurs* proper, was deliberately contrasted by the open discussion of the theories and paleontological speculations behind the series, through the *The Making of Walking with Dinosaurs*, which, in turn, caused further discussions in the media and the public at large. In this sense, the makers of *Walking with Dinosaurs* were also carrying out a historical BBC practice, instantiated by Attenborough, of presenting science in an open manner which allowed "viewers to witness and share in the process of knowledge production."[116]

Broad conclusion

Viewing all of this within the broader perspectives of the opening questions, it is clear that nearly all of the ways in which knowledge is produced by, and travels between, the BBC's natural history programs and the scientific community, as well as the public at large, directly contradict the idea of the "linear model". Historically, wildlife filmmakers in the BBC have never seen themselves as simply occupying a communicative role in a linear science-to-media-to-viewer model. Their engagement in television began, at least partially, as a reaction against an attitude within the scientific community which regarded field work as unscientific and amateurish. Key

[116] Gouyon 2019, p. 136.

figures within the BBC have in various ways since been engaged in practices of making their own statements about nature as well as revealing science as a messy unfinished process rather than a set of truths which it is their role to communicate faithfully. They have seen themselves as occupying a crucial, knowledge-producing role in a dynamic situation where knowledge is circulating in different ways between scientists, media creators, and audiences. Statements by Benton and other paleontologists make it clear that some scientists feel the same way. Furthermore, through considering the cultural impact of *Walking with Dinosaurs* with its co-phenomenon *Jurassic Park*, there is evidence to suggest that since their releases, the scientific community itself may have in some ways been reshaped by these alternative representations of nature. Evidence which, if verified, would indeed bring the circulation of knowledge, in this context, full circle.

Future research

Recently, the current head of the NHU, Julian Hector, interviewed David Attenborough for the sixtieth anniversary of the unit. Their conversation reveals not only that both Hector and Attenborough consider the founder of the NHU, Desmond Hawkins, to be the "unsung hero" of the history of wildlife television, but also that Hawkins was a lover of poetry with a particular passion for the novelist and poet Thomas Hardy.[117] Hawkins was a writer as well, and his rather extensive bibliography includes several books on Hardy who was, in turn, highly influenced by Romanticism and the work of William Wordsworth. There is in other words, a strong historical connection, intellectually, between British wildlife documentaries and the ideas of Romanticism. And in the other direction there is a direct connection between british wildlife films and environmentalism; Attenborough, who continues the legacy of Hawkins, is now an important voice in the fight against environmental damage and climate change and in 2020 alone released two documentaries on the subject. In fact, in the aforementioned interview, Hector, who also reveals himself as a passionate environmentalist, mentions that it was the NHU's very first presenter, Peter Scott, who, together with others, founded the World Wild Fund for Nature (WWF), in 1961, which is now the largest international NGO focused on environmentalism and

[117] "Sir David Attenborough | The Natural History Unit at 60 | EITF" [online video], *Edinburgh Television Festival*, 2017-04-24, https://www.youtube.com/watch?v=WRgiUND_2BA [accessed 2021-01-12].

the conservation of nature. It would not surprise me if Scott's paintings of nature, which have briefly been mentioned in this thesis, also drew on a history of Romanticism. A deep dive into the ideas of Hawkins, possibly along with Scott, to rescue him from his "unsung" status by producing a detailed historical account of his ideas, grounded in Romanticism, and his influence on the trajectory of natural history documentaries toward an alternative field science, in reaction against scientific reductionism, as well as his impact on early environmental awareness, would be fascinating. Such a historical account would not only be interesting in its own right but also highly relevant to the field of environmental history and the history of science and media.

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