4

‘You can’t make a film about mice just by going out into a meadow and looking at mice’: Staging as Knowledge Production in Natural History Film-making

Jean-Baptiste Gouyon

Speaking in October 2013 at a literature festival in Cheltenham to promote his autobiography, wildlife cameraman Doug Allan, famed for his work on such series as *The Blue Planet* (BBC, 2000), *Planet Earth* (BBC, 2007) or *The Frozen Planet* (BBC, 2011), ensured some publicity for himself with the incendiary statement that the BBC fakes wildlife shots all the time.[1] Allan was referring to the controversy that followed the broadcasting in 2011 of the series *The Frozen Planet* (BBC, 2011). It had then emerged that images of the birth of polar bears had been taken not in the wild, as the commentary may have led viewers to believe, but in a specially constructed den in a Dutch zoo. On the day after the row had erupted, the BBC issued a weak, half-apologetic statement confessing further faked footage in the series: a caterpillar was filmed freezing in a box and snowflakes were formed ‘in a controlled environment’. However, the BBC reassured audiences, the series ‘met expected editorial standards’, and was not intended to ‘mislead viewers’.2 Doug Allan’s point was that the BBC’s defence had not been bold enough. He went on:

> You can’t make a film about mice just by going out into a meadow and looking at mice. You need to introduce them to a safely built set in which they will be happy. There’s a lot of skill in doing that.[3]

Allan concluded that the BBC should have been 'proud' of the way in which it gathered footage, and should have made it obvious, rather than 'hiding the explanation on its website.'[4]

The artificiality, or constructedness, defended by Allan, stands in apparent contrast to the 'unrealisable fantasy' of observational realism, usually held to be the staple of wildlife documentary.[5] However, if wildlife films are approached as performative films, which 'perform the action they name', wildlife film-making does not appear any longer to be in rupture with the factual film-making tradition in which it belongs.[6] Rather it can be seen as an extension of this tradition's objective – the representation of reality – doubled with an heightened awareness of the necessary construction this aim entails, and with the will to acknowledge it.[7] But wildlife documentaries are a particular kind of performative films. Not only do they involve performances of the factuality of nature, but also, and primarily, performances of science. For, as Bruno Latour demonstrated, agreement upon the factuality of nature is a consequence of the scientific endeavour.[8] Performing nature thus involves performing science. And as Doug Allan pointed out, natural history film-making involves the deployment of a huge amount of knowledge (of animal behaviour and life cycle, of ecosystems and biotopes, for example) and technical skill. The disclosure of their techniques, Allan argued, for instance in making-of documentaries, should reinforce rather than undermine film-makers' cognitive trustworthiness.

Indeed, 'strategies of disclosure and concealment' are at the core of the relationship between audiences and scientific performers, as Iwan Morus has shown in his study of Victorian scientific showmen who specialised in producing illusions that beguiled onlookers in order to educate them.[9] In particular, revealing one's technical ability, one's 'hands-on know-how' usually provided good support for claims to cognitive authority.[10] Similarly,

when wildlife film-makers display their ingenuity at re-constructing nature through making-of documentaries, they lay claims about the validity of film-making as a mode of relation to nature and animals, in order to produce reliable knowledge of the natural world.

The disclosure of technical skills (as opposed to their concealment) points to the notion of witnessing, established as the cornerstone of experimental science in the seventeenth century.[11] Robert Boyle, one of the main proponents of this new approach to making science, insisted that experiments should be conducted in public, or at least in social spaces that allowed witnesses to see for themselves how things were done. Boyle also devised 'a literary technology of virtual witnessing'.[12] A combination of visual representations and texts, this was intended to multiply witnesses to an experiment by incorporating those people at a distance, in both time and space. Images were pivotal to that purpose: '[b]y virtue of the density of *circumstantial detail* that could be conveyed […] they [images] imitated reality and gave the viewer a vivid impression of the experimental scene'.[13] Making-of documentaries are similarly intended to allow for virtual witnessing. They show viewers how things were done, demonstrating film-makers' 'property of skill', their capacity to control nature so as to generate valuable knowledge of it. [14]

Although this chapter is neither about mice nor about the specific case of the series *The Frozen Planet* (BBC, 2011), it is a discussion of how and what it means for the documentary process to involve the staging of nature. The main object of study for this chapter is the 2001 feature film *Winged Migration* (Perrin, 2001), directed by Jacques Perrin, and the associated making-of documentary (Barbé, 2002). I put this material in relation to other nature films, especially the 1972 *The Flight of the Snow Geese* (Bartlett & Bartlett, 1972), by Des Bartlett and Jen Bartlett, for which no making-of documentary was shot. In both cases, trained birds were used in order to obtain close-up images of birds in flight, which were thereafter inserted into the wildlife films. I shall seek to explore how film-makers dealt,

both on screen and in the support material for each film, with the apparent contradiction between wild life and trained performers.

Comparing the two films brings to the fore an important contrast between narrative structures. In the 1972 feature, *The Flight of the Snow Geese,* both tame and wild birds appear on screen, but trained birds and wild ones are kept explicitly separate in two distinct story lines, conducted side by side within the same filmic space. In the case of *Winged Migration,* a single story line runs in the feature film, and all the birds eventually appear on screen as wild ones. The explicit identification of the trained birds is kept for the making-of documentary, whose narrative revolves around their rearing, training and filming. Some thirty years separate the two films, and this formal contrast between the two suggests that in this interval the claimed status of the film-object, and the meanings attached to the film-making process in relation to the production of knowledge significantly evolved.

From approximately the late 1960s to the early 2000s, wildlife film-making had evolved through a process of increased 'purification' leading to the production of purified representations of the working of nature, devoid from any sign of human involvement and animal labour. [15] These are what scholars have called the 'Blue-Chip documentaries', wildlife films with a high production value and typically depicting a nature stripped of any trace of human presence. [16] These representations of the natural world have been criticised as encouraging a vision of nature as something to be visually enjoyed rather than physically engaged with.[17] Yet the development of these purified representations of nature has been paralleled with the practice of producing and releasing making-of documentaries alongside them. These making-of documentaries depict film-making as what Bruno Latour has called 'a work of translation', and films as 'hybrids of nature and culture' that create the conditions for the formation of networks of humans and non-humans. [18] Indeed, making-of documentaries specifically emphasise film-makers' relational engagement with nature and animals when

producing their documentaries. In turn, the resulting blue-chip documentaries provide audiences with the possibility to engage with the natural world in a seemingly unmediated way. In wildlife making-of documentaries wildlife film-making is fashioned as a form of meaningful exchange; as the shared labour of humans and animals that enables the former to obtain better knowledge and understanding of the latter. The disclosure of the material means involved in the production of the films is an invitation to audiences to share, as witnesses, in this labour of knowledge production.

To put it another way, parallel to the development of the blue-chip documentary genre is that of the making-of documentary genre. This joint development signals a change in the ethics informing natural history film-making, from hands-off to hands-on. Wildlife film-makers from the early 1900s to the late 1960s (all of whom were naturalists turned cameramen) prided themselves on their ability to obtain images of animals without intervention (thus maintaining the postulate of a genuine separation between nature and culture). By contrast, from the late-1960s wildlife film-makers tended to promote film-making as an epistemologically valid means of intervening in nature, which they achieved via making-of documentaries. This genre can be seen as a means for film-makers to invite viewers to give their consent to this interventionist approach to producing wildlife films. Analytically, this evolution of the culture of wildlife film-making makes it necessary to consider the documentary and its making-of as a single object of study, in order to make sense of both.

In addition, two kinds of performance appear worth considering here, that of animals and that of film-makers.[19] In his work on performances, Richard Schechner has suggested that performers are at the same time ‘not themselves’ and ‘not not themselves’.[20] In this interval between the character and the performer a commentary can be inserted.[21] Schechner’s conceptualisation is useful in thinking of nature films as objects of knowledge,

as outcomes of practices of making that embody cognitive claims about how the world is and how it works.

In nature films, animals, often tamed or at least habituated to humans, are staged as wild in order to represent what is known about their species. In these performances, they are at the same time not-themselves, for example they stand in for, or act as, their wild brethren, and not-not-themselves, since they remain individual animals, albeit made to perform in front of the camera to represent their species. Film-makers, when they appear in a making-of documentary, tend to present themselves as knowledge producers (not-themselves), but also as film-makers presenting themselves as knowledge producers. In the interval which both types of performance creates, a commentary is inserted on the material process of film-making, as a necessary artifice if the film is to stand as object of knowledge at all. In turn, a claim is made about film-makers' status, whose professionalism is emphasised by contrast with naturalists' status as amateurs. This latter claim can be compared to similar ones laid by life scientists at the end of the nineteenth century, when the pursuit of knowledge in fields like comparative anatomy, zoology, or taxonomy, became professional careers 'patrolled by disciplined experts'.[22] In what follows I shall reflect on these ideas through an examination of how the meaning of "staging" has shifted from the source of "fakery" to being the necessary condition of knowledge production in relation to wildlife film-making.

Winged Migration: Staging as Production of Knowledge

An account of a year in the life of migratory birds, *Winged Migration* is shot so as to create in spectators the impression that they are part of the flock. Nothing is left in the frame that would prevent the illusion of an intimate relationship with the animals from crystallizing. The spoken commentary is reduced to a minimum; most of the soundtrack is constructed of bird

sounds accompanied by vocal music. Birds in flight are shot close-up, placing spectators in a position from where they can share the way birds see the world whilst migrating. As Burt has argued, this 'shared glance…suggests that we are looking from within nature and not at nature'.[23] By installing spectators in a visually mediated physical intimacy with the animals, the film brings audiences closer to nature, and fosters a strong emotional engagement with it. This imaginary physical proximity materializes the natural historical knowledge of the birds' odyssey, making it a real part of the viewers' lived experience.

In order to achieve this 'spectacular effect', a thousand birds of nearly 40 different species were turned into disciplined 'avian actors', using the technique of imprinting pioneered by Konrad Lorenz. [24] The birds were then brought on location by plane or truck, along known flyways for their species on every continent, and filmed against dramatic backgrounds to construct a visual geography of bird migration. This process involves, for example, first gathering the eggs of pelicans (obtained at the Djoudj bird sanctuary in Senegal). These were then carried in in-flight incubators to the film director's estate in Normandy (France) and incubated there in specially designed facilities until hatching. The chicks were then imprinted on a couple of human care-takers, who would train them to respond to their call, and to get used to being filmed whilst flying. Once the birds had reached the appropriate development stage, they were packed in wooden crates and flown back to the Senegalese Djoudj bird sanctuary, to be filmed with their native environment in the background. They were then taken to Kenya, so that shots of pelicans flying above the savanna with Mount Kilimanjaro as a backdrop could be obtained. Overall the aim was to create a cinematic representation of pelicans' migration across the African continent, as plotted by ornithologists. Throughout *Winged Migration,* accepted knowledge of the natural phenomenon of bird migration is thus reconstructed via a complex staging involving transportation, care, training, and management.

In the resulting feature, close-ups and intimate shots of these trained birds mix indiscriminately with larger shots of wild birds. These were taken in the field by cameramen sent around the world, who had been specifically instructed to use the same cameras and 35mm film gauge as the crews filming the imprinted birds. Although this made it very cumbersome for field cameramen, more used to shooting in 16mm, in this way their footage of wild birds could easily be edited with those of trained ones, thus dissolving the wild/tame dichotomy. Certainly, viewers would not be able to distinguish between the two kinds of footage were it not for the making-of documentary (MOD) released alongside the main feature. In that documentary the tone is celebratory, and making the film is presented both as human achievement and as adventure:

> In July 1998 on the island of Skrudur, a wildlife sanctuary south of Iceland, our shooting begins. No fixed shots. Our cameras must be free to move at will. This means hauling masses of heavy equipment by hand. To reach this barren rock 30 minutes from the mainland, we have to cross the open sea. Our adventure has begun. (Barbé, 2002)

The MOD provides every detail about how things were done, explicitly juxtaposing behind-the-scene sequences with the corresponding scenes from the film. Fully disclosing that trained birds were used and how they had been trained, explaining which equipment was necessary to film them, from specially designed ultra-lights to radio-guided cameras through to hot-air balloons, the MOD is a demonstration of the film-makers' property of skill, of their ingenuity at controlling nature:

> It takes a lot of research to reconcile the constraints of flying with the needs of film-

> making. There is not established technique for this kind of shooting. We had to design and build everything from scratch. (Barbé, 2002)

However, looking at this documentary more closely, a specific kind of staging can be recognized. First, science is staged so as to accommodate film-making as a legitimate means of knowledge production. Second, the making of the film is staged so that it appears scientific. In an effort to avoid the use of trained birds lessening the film's value as a source of knowledge about the natural phenomenon of bird migration, the MOD puts to work various narratives in order to define film-making as part of the scientific enterprise.

Staging Film-making as Science Making

To begin with, the whole project worked with and investigated the techniques of physiologist and naturalist Konrad Lorenz. In *Winged Migration* Lorentz's theory of imprinting was submitted to new tests, as species never before tried for this technique, it is claimed, were successfully used:

> In the 1930s, as part of his work on animal behaviour, Konrad Lorenz developed the concept of imprinting. This great Austrian naturalist and Nobel physiology prize winner made himself the foster father of dozens of baby geese. In applying this concept to make a movie we were heading into unknown territory. Konrad Lorenz's imprinting technique was not known to work with species other than geese. Whereas we want to fly not just with geese but also with ducks, swans, pelicans, storks and cranes. (Barbé, 2002)[25]

The making of *Winged Migration* is thus presented as consolidating and expanding existing knowledge, and as such it appears to participate in the making of science. The narrative at this point is reinforced by an almost scientistic aesthetic. Technological imagery pervades the representation of the moment when the chicks to be imprinted hatch, and of their subsequent rearing. They come to the world out of numbered eggs, lying not in nests but in aseptic metal boxes, in a spotless environment. Chicks are then shown being fed by anonymous hands gloved in latex and manipulating syringes, very much like laboratory animals. The message is clear: the birds appearing in the film may be trained ones but they have been obtained through technologically mediated, scientifically informed means. They are, it may be argued, rational and objective birds.

Just as with laboratory animals, viewers of the MOD are not encouraged to conceive of these birds as subjects. Each one of them is a specimen, standing for a flock, a group, and their species. Throughout the making-of documentary, as indeed in the feature film, nothing enables viewers to identify either individual birds or birds as individuals. Notably, whilst the care-takers may have named the animals they looked after (as is suggested in the making-of documentary), these names remain unknown to viewers. Such prevention of individualization keeps at bay the idea that these birds may be pets, which would remove them from the realm of wildlife and lessen their value as objects of knowledge.[26] The birds, despite their imprinting and training, must remain worthy as entities that can answer questions about the natural phenomenon of bird migration.

The most efficient way of demonstrating that trained birds and wild birds remain equally valid as sources of knowledge of bird migration is to have scientists using them as objects of knowledge. In order further to assert film-making as a part of the scientific enterprise, the MOD displays scientists visibly enrolled in that project. Thus, the film-director Jacques Perrin is staged as the spearhead of ‘one of the largest “private” ornithological

networks the world has ever known'.[27] We witness him hosting a meeting with scientists at his home and talking with them as equals. And once the shooting has begun, some of the scientists joined him on the set to advise:

> Jean Dorst, Guy Jarry, and Francis Roux, all from the Paris Museum of Natural History, signed on as our scientific advisers. With their help, we picked the best species to imprint, the best migration routes to follow, and the biggest gathering places of wild birds around the world. Their help throughout the film would prove invaluable. (Barbé, 2002)

Some of these bird experts, whilst on location, were also able to produce knowledge for themselves. One of them, Henri Weimerskirch, from the Centre d'Etudes Biologiques de Chizé (CNRS), worked as an adviser with the film crew which took images of pelicans in Senegal. During their stay in Africa, Weimerskirch and his research team studied the energy expenditure of pelicans flying in "V" formation, which led to a publication in *Nature*.[28] Using one of the film-crew's ultra-lights they flew alongside the imprinted pelicans and measured their heart rate, thus demonstrating that flight formation enable birds to save energy.[29] In 2003 when *Winged Migration* was released in the USA, Weimerskirch was interviewed for a piece in the *New York Times*, as an adviser for the film. He was described as a biologist who 'had been working with birds for 20 years, studying the energetics of their flight', and was said to have 'of course [...] never flown with them' during all this time. He was then quoted: 'It was incredible to be with the animal itself.…There, you can see exactly how it works'.[30]

This latter story exemplifies how science is staged in relation to the making of a wildlife film, in order to fashion film-making as a participator in the production of knowledge. Scientists advising on the set are shown as having access to perspectives they

would not have been able to reach otherwise. The film-set thus becomes a place where genuine knowledge is produced. This interpretation is corroborated by the funding application the film's producers submitted to the European Environmental Fund. Describing the project, and how scientists would be involved in it, it reads:

> [t]he specific outlook of these scientists and their knowledge of the bird [sic] different behaviours allow us to have a better cinematographic approach. On their side, this film is a unique opportunity to carry out comparative behavioural studies and to deepen their knowledge of birds.[31]

To have participating scientists appearing to produce original knowledge of the natural world with the film's imprinted birds further dissolves the distinction between wild and tame, perhaps even making it irrelevant.

The dual staging at work in the making-of documentary – that of film-making as a legitimate way of producing reliable knowledge of the natural world, and that of science so that it can accommodate film-making as an appropriate form of participation in the scientific endeavour – is rendered necessary by another kind of staging going on in the feature film. Trained birds were used to represent aspects of the behaviour of wild birds in order to reconstruct the natural phenomenon of bird migration on screen. In the next section, I want to think through this kind of performance by considering the earlier film *The Flight of the Snow Geese*, which depicted a similar bird migration, and for which birds imprinted on humans were similarly trained in order to get close-ups of birds in flight. A notable difference from *Winged Migration* is that no making-of documentary was released alongside *The Flight of the Snow Geese*. Rather, the film-makers chose to interweave the staging of trained birds within their representations of wildlife.

The expert naturalists

Des Bartlett and Jen Bartlett's 1972 documentary followed flocks of snow geese as they travelled from the tundra around Hudson Bay in the Canadian Arctic to the Mississippi Delta. It also depicts the adventures of the naturalist film-makers. Written and produced by Colin Willock for Anglia TV as part of their successful series *Survival*, it was shown in Britain as a Christmas Special on ITV on 26 December 1972. The Bartletts spent the four months of the Arctic summer on the birds' breeding ground. Following scientists' advice they settled next to a colony in the vicinity of the McConnell River, sleeping in tents at a study base which the University of Western Ontario maintained there. During this time they collected a dozen orphaned goslings. In the words of Colin Willock:

> The idea was that Des [Bartlett] should collect a number of snow goose goslings on the tundra, hand-rear them and band them with coloured rings so that they would be recognizable in flight. He would then bring them down the flyway with the wild skeins in order to film them flying free.[32]

Having imprinted the goslings, the Bartletts then, as was the case during the pre-production phase of *Winged Migration*, habituated the birds to being filmed. 'Right from the beginning,' Des Bartlett explained in a letter to his producer, 'we used the tame goslings to cut in with the wild action'.[33] Later, these tame birds enabled them to shoot slow-motion footage of geese in flight: 'Shot against a clear sky background, it gave the impression that you were actually flying wingtip to wingtip with the geese as part of their skein'.[34] Or, as the Bartletts commented in the film's accompanying book, which they published in 1975, these close-ups 'make the viewer feel that he [sic] is seeing the geese through the eyes of one of the birds

actually in formation'.[34] Just like in *Winged Migration*, tame birds were thus used to obtain footage which would have been impossible to get otherwise. Similarly, they contributed to creating in viewers an impression of intimate physical proximity with the birds, the impression of being part of nature rather than simply spectators of it.

An important difference between the two films, however, is that two distinct story-lines were constructed within *The Flight of the Snow Geese*, which kept separate each kind of birds. The first story-line was that of the flocks of snow geese migrating from the North to the South of the north-American continent which provided the main focus of the film. The second story-line was the story of the rescue, imprinting, training and filming of orphaned goslings. As Colin Willock's account of the production of the film shows, this secondary story-line was built in within the film as the shooting was progressing and the rushes started to arrive in London. Willock and the Bartletts agreed that the story of the film-makers rescuing orphaned birds, looking after them, and filming them, 'the new thought which we both share enthusiastically: the question of the tame family of geese,' would make for a compelling movie. [35] Within the one hour film, this interlaced narrative is one of the elements that invite audiences to trust the film-makers as reliable and trustworthy sources of knowledge, as it demonstrates their intimacy with the natural world.[36]

The Bartletts freely admitted in the companion book to having named the imprinted birds, which they called collectively 'the Creeps'. They also emphasised their ability to individualise the birds, which set them apart from 'strangers': 'to a stranger each of the Creeps looked the same, but we had no trouble telling them apart'.[37] In the film, the imprinted birds appear as pets that nonetheless provide the film-makers and audiences with insights about the natural world they could not obtain otherwise. As the Bartletts concluded, 'the Creeps taught us a great deal about the ways of snow geese'.[38] Through the 'superb-slow-motion footage', 'these miraculously beautiful shots' filmed whilst the imprinted birds

were flying alongside the Bartletts' station wagon, viewers were offered knowledge of, for example, the anatomical aspects of bird flight.[39] These shots were edited to provide the film's opening sequence. Nevertheless, a later sequence revealed how they were obtained, thereby making sure that the images would not be mistaken for those of wild birds.

Maintaining the wild/tame boundary was essential for the film's cognitive legitimisation. The film-makers' demonstrated ability to travel safely across that boundary without misrepresenting nature stood as further evidence of their reliability as knowledge producers. The trust obtained by the film-makers in turn brings cognitive legitimacy to the film. In *Winged Migration*, by contrast, trust is solicited less for the film-maker than for film-making, which is actively presented as a mode of knowledge production in which the tame/wild distinction is irrelevant.

Claiming Artificiality Back

The comparison of these two films, produced three decades apart, suggests that in the intervening period a move took place within the culture of natural history film-making; away from the regime of cognitive legitimisation originating in the cultural repertoire of amateur natural history, and towards one pertaining to professional film-making. In 1971, in the introductory chapter of a book titled *Making Wildlife Movies*, Christopher Parsons, then a senior producer at the BBC Natural History Unit, wrote: 'the film-maker's only obligation to his audience is to ensure that his film is true to life, *within the accepted conventions of film-making*'.[40] As Parsons explained, his phrase in italics specifically refers to the use of captive or tame animals in place of wild ones in order to get shots that would be very difficult to obtain in the wild, 'yet would make a point of some value to the film'.[41] However, as Parsons also notes, 'Purists will throw up their hands in horror at such an idea'.[42] The 'purists' here are naturalists turned film-makers, who dominated natural history film-making from the early

1910s to the late 1960s before it became a profession.[43] To them, the essence of film-making laid in pitting their senses against the animals'.[44] Not only did they value the skills and virtues of field observation, 'field craft' and natural history's 'aesthetic of close detachment', they also appropriated those of big game hunters, displacing their authority as experts of the natural world. [45]

Cherry Kearton (1871-1940), a naturalist active before the First World War and in the interwar period, noted that naturalist cameramen would demonstrate their natural historical knowledge with footage that showed animals:

> not aware of anything near them, their behaviour being as unsuspicious as that of English cattle at a pond. It is this naturalness in a picture that is the test of the photographer's success. If a film shows animals alert, watchful, and suspicious, it is sure proof that the photographer was not properly hidden.[46]

These natural history film-makers were unarmed hunters, whose camera had replaced the gun. Each close-up of an animal was the result of 'a battle of wits'.[47] Their expertise rested on their capacity to endure the patience and discomfort involved in getting as close as possible to a wild animal without its knowledge. The phrase 'unarmed hunters' was used in 1963 as a title for a half-hour documentary depicting the film-making work conducted at the BBC Natural History Unit (NHU) in Bristol. The film, produced and directed by Christopher Parsons, affixes the label 'unarmed hunter' to more people than just the naturalist cameramen working in the field: including producers, film editors, sound recordists, and cameramen whose stock in trade was to film animals such as fish, amphibians, insects or small mammals, in a controlled environment. *Unarmed Hunters* (BBC, 1963) indicates that by the mid-1960s, the BBC NHU was starting to initiate a shift regarding what were to be accepted as

appropriate practices in natural history film-making. Notably, the commitment to observational realism, an almost undisputed dogma until the 1970s amongst wildlife film-makers, made way in favour of a claimed artificiality. This shift was accompanied by the appearance of the making-of documentary genre, which it is tempting to see as an off-shoot of the direct cinema movement, wildlife film-makers self-reflexively applying to themselves the claims of observational realism they were at the same time about to abandon in their own films. After *Unarmed Hunters*, Mick Rhodes produced a *Horizon* episode unambiguously titled 'The Making of a Natural History Film' (BBC, 1972). As in 1963, it placed the emphasis on the technical work of wildlife film-making, notably disclosing how close-up shots of a wood wasp laying its eggs, or of tadpoles, could be obtained by filming these animals with macro cinematography equipment under controlled conditions.

These making-of documentaries all present film-making as a collective work, in contradistinction with the image of the solitary and heroic naturalist cameraman who prevailed in what could be called the pre-making-of era. They also insist that some forms of staging do not invalidate the films scientifically. Instead, they turn the film studio, where reconstructed bits of nature are used to shoot in a controlled environment, into a place akin to a laboratory where natural phenomena can be studied away from the vagaries of the field. Finally, these documentaries participate in the fashioning of professional wildlife film-makers as participants in the sciences, as they show them interacting with scientific practitioners on the set.

Conclusion: Fact and Fiction

From *Winged Migration*'s making-of documentary, the birds emerge also as actors. Their carefully staged performances made possible the production of genuine knowledge about the

natural phenomenon of bird migration. The film-maker emerges as a demiurge, an active and subjective creator of meaning about the natural world. Not is the film-maker anymore soliciting trust as a 'silent watcher', as a passive and objective recorder of reality, but instead, through the expert deployment of film-making skills, is revealing aspects of the natural world that would have remained invisible within the boundaries of observational realism. [48] This suggests a shift in the values and meaning associated with staging and reconstruction. Instead of being seen as potential sources of fakery, they are claimed as a practical means towards a better understanding of the natural world. As much as it dissolves the wild/tame distinction, *Winged Migration* exemplifies a dissolving of the boundary between facts and fiction. The film medium loses its assumed transparency. Both the production and the reception stage gain in thickness as they become key sites of knowledge production. At the junction between these two sites stands the illusionary power of film.

As a reply to the charge of fakery brought against *The Frozen Planet*, David Attenborough (who narrated the British version of the series) offered the following defence:

> The question is, during the middle of this scene when you are trying to paint what it is like in the middle of winter at the pole, to say 'Oh, by the way, this was filmed in a zoo'. It ruins the atmosphere, and destroys the pleasure of the viewers and destroys the atmosphere you are trying to create.... Come on, we were making movies.[49]

Here Attenborough suggests that natural history film-making can use fiction as a means of producing facts. He argues in favour of the need to preserve the illusionary power of film, using it as an argument to defend wildlife film-makers' right to construction. With this conflation of the two supposedly separate realms of facts and fiction emerges the notion that

imagination is an essential resource for wildlife film-makers to draw on if their films are to work as objects of knowledge.

If we consider the history of the genre of the natural history film, the comparison between *The Flight of the Snow Geese* and *Winged Migration* suggests that during the late 1960s and early 1970s, natural history film-making moved away from the realm of amateur natural history and became a professional pursuit patrolled by technical experts. This evolution entailed a change in the way natural history film-makers would support their claims to knowledge. In the early decades of the twentieth century, they echoed Victorian amateur naturalists' and big game hunters' discourse, foregrounding such themes as patience, self-discipline, self-restraint, bodily suffering, communion with nature, and the ability to outwit animals. By contrast, late twentieth century wildlife film-makers would rather highlight their mastery of the film-making apparatus, and all the tricks they used to recreate nature on screen. The 1970s is a period of transition between these two regimes, with self-styled professional natural history film-makers like the Bartletts demonstrating their technical expertise whilst remaining true to the traditional values and beliefs of amateur natural history. The appearance and development of the making-of documentary seems to be a good indicator of this transition. Indeed, it arose from the necessity to remove from the films everything that could destroy the atmosphere film-makers were trying to create and thereby reduce viewers' pleasure. At the same time the making-of documentary enables wildlife film-makers to claim back the artifice and define their practice as a meaningful way of intervening in nature, and thus of knowing it.

From a broader perspective, the reading offered in this chapter contributes to a wider understanding of scientific performance, or of the relations between science and performance. Disclosing the practical means involved in performances of science which, ultimately are demonstrations of performers' 'property of skill', making-of documentaries stand as evidence

of film-makers' capacity to control nature so as to generate valuable knowledge of it. [50] But, this chapter shows, in addition to defining film-makers' personal identity as trustworthy spokespersons for nature, making-of documentaries are statements which characterise the material practice of film-making as relevant to the production of knowledge. This is, in significant ways, similar to the instrumental skills required by scientific demonstrators of the Victorian period, as Iwan Morus has shown in an earlier chapter. In these documentaries science and film-making are both staged so that the latter can appear as a material practice that valuably contributes to science. At the juncture of this dual staging stands the intrinsic artifice of film-making. As a joint staging of science and film-making, the making-of documentary institutes artifice as necessary to obtain knowledge of nature. Considering how masks in Noh drama, too small to completely dissimulate performers' visage, create an interval between actors and characters, Richard Schechner meditates that the essence of the performance, as a means of understanding, resides in this interval between the performer and the performed.[51] Likewise, nature on screen is at the same time not-nature and not-not-nature. And from the interval between the two, generated by the artifice of film-making, new understandings, new knowledge of nature can originate.

NOTES

I should like to express my gratitude to Martin Willis at first for inviting me to present this paper at the workshop Staging Science, held at the University of Westminster in December 2013, and then suggesting that it should be part of the present collection. I am also grateful to the participants in the workshop for insightful remarks and comments.

1. Rosie Taylor, 'BBC "fakes wildlife shots all the time": Veteran cameraman claims species 'smaller than rabbits' are filmed on custom-built sets', *Daily Mail*, 9 October 2013.
2. Daily Mirror, 'Frozen Planet scandal: Sir David Attenborough defends fake polar bear footage', *Daily Mirror* 13 December 2011.
3. Taylor, 'BBC "fakes wildlife shots all the time"'.

4. Taylor, 'BBC "fakes wildlife shots all the time"'.
5. Stella Bruzzi, *New Documentary* second edition (London: Routledge, 2006) p.217.
6. Bruzzi, *New Documentary*, p.187.
7. Bruzzi, *New Documentary*.
8. Bruno Latour, *We have never been modern* (Cambridge, MS: Harvard University Press, 1993).
9. Iwan Rhys Morus, 'Seeing and Believing Science', *Isis*, Vol. 97 (2006):101-110, p.105.
10. Iwan Rhys Morus, 'Worlds of Wonder. Sensation and the Victorian Scientific Performance', *Isis*, Vol. 101(2010): 806-816, p.807.
11. Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump* (Princeton, NJ: Princeton University Press, 1985).
12. Shapin and Schaffer, *Leviathan*, p.60.
13. Shapin and Schaffer, *Leviathan*, p.62 – emphasis in the original.
14. Iwan Rhys Morus, 'Manufacturing Nature: Science, Technology and Victorian Consumer Culture', *The British Journal for the History of Science*, Vol. 29 (1996):403-434, p.416.
15. Latour, *We have*, p.11.
16. See for instance Derek Bousé, *Wildlife Films* (Philadelphia: University of Pennsylvania Press, 2000); Simon Cottle, 'Producing Nature(s): On the Changing Production Ecology of Natural History TV', *Media, Culture and Society*, Vol.26 (2004):81-101.
17. Gregg Mitman, *Reel Nature* (Cambridge, MS: Harvard University Press,1999), p.206.
18. Latour, *We have*, p.10-11.
19. To an extent, nature films appear as performative films, conceptualised by Stella Bruzzi as films that perform what they name, see Bruzzi, *New Documentary*.
20. Richard Schechner, *Between Theater and Anthropology* (Philadelphia: University of Pennsylvania Press, 1985), p.6.
21. Schechner, *Between*, p.9.
22. James A. Secord, 'The crisis of nature', in Nick Jardine, James Secord, and Emma C. Spary, (Eds), *Cultures of natural history* (Cambridge: Cambridge University Press, 1996), p.447-459, p.449.
23. Jonathan Burt, *Animals in films* (London: Reaktion Books, 2002), p.47.
24. The notion of 'spectacular effect' is developed in Fred Nadis, *Wonder shows: performing science, magic, and religion in America* (New Brunswick, NJ: Rutgers University Press, 2005). The phrase 'avian actors' comes from Jacques Perrin and Jean-François Mongibeaux, *Winged Migration* (San Francisco: Chronicle Books; Paris: Editions du Seuil, 2003). Imprinting is a technique formalized by Austrian ethologist Konrad Lorenz and consisting in habituating a bird to a single human being from birth so that the bird will direct its instinctive behavior towards the human as if it were its parent. For more on Lorentz see Richard Burkhardt, *Patterns of Behavior* (Chicago: University of Chicago Press, 2005).
25. The image of science which this quote supports is akin to the popularised Popperian view of the scientific enterprise, inviting us to understand the production of theoretical knowledge as an endless repetition of the sequence hypothesis, test, refutation/validation, and bringing us ever closer to a true knowledge of nature. The making of the film is presented as participating in the same logic. See Karl Raimund Popper, *The Logic of Scientific Discovery* (London: Routlegde, 2002 [1959]).
26. Lynda Birke, 'On Keeping a Respectful Distance', in Birke, L. I., and Hubbard, R. (Eds). *Reinventing biology: Respect for life and the creation of knowledge* (Bloomington and Indianapolis: Indiana University Press, 1995), p.75-88.
27. Perrin and Mongibeaux, *Winged Migration*, p.230.
28. Henri Weimerskirch & al., 'Energy saving in flight formation', *Nature*, Vol. 413 (2001), p. 697-698. It is notable that the postal address of three co-authors of this study is that of Jacques Perrin's production company, Galatee film, thus squarely installing the film project within the boundaries of science.
29. The conclusion of this study is mentioned in the 2009 BBC series *Life*, in the episode 'Birds', during the sequence showing pelicans flying in formation. The producer of the episode, Patrick Morris, confirmed that Weimerskirch's paper was actually used as a source for the

commentary (Patrick Morris, personal communication to the author). It is a nice case of knowledge obtained during the shooting of a natural history film being then communicated through another nature film.

30. James Gorman, 'Inviting Humans to Sprout Wings and Soar', *The New York Times*, 15 April 2003.
31. Anonymous, 'The Winged Migration' (Brussels: European commission, 1999).
32. Colin Willock, *The World of Survival* (London: André Deutsch, 1978) p.127.
33. Willock, *The World*, p.131.
34. Willock, *The World*, p.147.
35. Des Bartlett and Jen Bartlett, *The Flight of the Snow Geese* (Toronto and London: Collins and Harvill Press, 1975), p.114.
36. Willock, *The World*, p.135.
37. Jean-Baptiste Gouyon, 'From Kearton to Attenborough. Fashioning the telenaturalist's identity', *History of Science*, Vol.49 (2011), p.25-60.
38. Bartlett and Bartlett, *The Flight*, p.116.
39. Bartlett and Bartlett, *The Flight*, p.175.
40. Willock, *The World*, p.133, and p.146.
41. Christopher Parsons, *Making Wildlife Movies, an introduction* (Newton Abbot: David & Charles Ltd., 1971), p.14 – emphasis in the original.
42. Parsons, *Making*, p.15.
43. Parsons, *Making*, p.15.
44. Jean-Baptiste Gouyon, 'The BBC Natural History Unit: Instituting natural history film-making in Britain', *History of Science*, Vol. 49 (2011), p.425-451.
45. Christopher Parsons, 'The Silent Watcher', in Boswall, J. (Ed.), *Look: a selection from the BBC-TV natural history series* (London: British Broadcasting Corporation, 1969), p.13-19, p.18.The 'aesthetic of close detachment' is from Gail Davies, 'Narrating the Natural History Unit: institutional orderings and spatial strategies', *Geoforum*, Vol.31 (2000), p.539-551. For the genealogy of natural history film-making in big game hunting see Gouyon, 'From Kearton'
46. Cherry Kearton, 'Big Game hunting. Sport with the camera', in 'Film Number', *The Times*, supplement to Issue No: 45155, 19th March 1929, p.X, quoted in Gouyon, 'From Kearton', p.38.
47. Parsons, 'The Silent Watcher', p.18.
48. Parsons, 'The Silent Watcher'.
49. Daily Mirror, 'Frozen Planet scandal: Sir David Attenborough defends fake polar bear footage', *Daily Mirror*, 13 December 2011.
50. Morus, 'Manufacturing Nature'. See also Morus, 'Worlds of Wonder.'.
51. Schechner, *Between*, p.6-9.

REFERENCES

Anonymous, 'The Winged Migration' (Brussels: European commission, 1999). Available online at http://www.ec.europa.eu/environment/funding/projects/1999/3a.htm

Barbé, Oli, *The Making-of Winged Migration* (Paris: Galatée Films, 2002).

Bartlett, Des and Bartlett, Jen, *The Flight of the Snow Geese* (Norwich: Anglia Television, 1972).

Bartlett, Des and Bartlett, Jen, *The Flight of the Snow Geese* (Toronto and London: Collins and Harvill Press, 1975).

BBC, *The Making of a Natural History Film* (London: BBC, 1972).

BBC, *The Blue Planet* (London: BBC, 2000).

BBC, *Planet Earth* (London: BBC, 2007).

BBC, *The Frozen Planet* (London: BBC, 2011).

Birke, Lynda, 'On Keeping a Respectful Distance', in Birke, L. I., and Hubbard, R. (Eds). *Reinventing biology: Respect for life and the creation of knowledge* (Bloomington and Indianapolis: Indiana University Press, 1995), p.75-88.

Bousé, Derek, *Wildlife Films* (Philadelphia: University of Pennsylvania Press, 2000).

Bruzzi, Stella, *New Documentary*, second edition, (London: Routledge, 2006).

Burkhardt, Richard W., *Patterns of Behavior: Konrad Lorenz, Niko Tinbergen, and the Founding of Ethology* (Chicago: The University of Chicago Press, 2005).

Burt, Jonathan, *Animals in films* (London: Reaktion Books, 2002)

Cottle, Simon, 'Producing Nature(s): On the Changing Production Ecology of Natural History TV', *Media, Culture and Society*, Vol.26 (2004), p.81-101

Daily Mirror, 'Frozen Planet scandal: Sir David Attenborough defends fake polar bear footage', *Daily Mirror* 13 December 2011. Available online at: <http://www.mirror.co.uk/tv/tv-news/frozen-planet-scandal-sir-david-96593> (last accessed: 09/09/14).

Davies, Gail, 'Narrating the Natural History Unit: institutional orderings and spatial strategies', *Geoforum*, Vol.31 (2000), p.539-551.

Gorman, James, 'Inviting Humans to Sprout Wings and Soar', *The New York Times*,

15 April 2003, available online at: <http://www.nytimes.com/2003/04/15/science/inviting-humans-to-sprout-wings-and-soar.html> (last accessed 09/09/14).

Gouyon, Jean-Baptiste, 'From Kearton to Attenborough. Fashioning the telenaturalist's identity', *History of Science*, Vol.49 (2011), p.25-60.

Gouyon, Jean-Baptiste, 'The BBC Natural History Unit: Instituting natural historyfilm-making in Britain', *History of Science*, Vol. 49 (2011), p.425-451.

Kearton, Cherry, 'Big Game hunting. Sport with the camera', in 'Film Number', *The Times*, supplement to Issue No: 45155, 19th March 1929, p.X.

Latour, Bruno, *We have never been modern* (Cambridge, MS: Harvard University Press, 1993).

Mitman, Gregg, *Reel Nature* (Cambridge, MS: Harvard University Press, 1999).

Morus, Iwan R., 'Manufacturing Nature: Science, Technology and Victorian Consumer Culture', *The British Journal for the History of Science*, Vol. 29(1996), p.403-434.

Morus, Iwan R., 'Seeing and Believing Science', *Isis*, Vol. 97(2006), p.101-110.

Morus, Iwan R., 'Worlds of Wonder. Sensation and the Victorian Scientific Performance', *Isis*, Vol. 101(2010), p.806-816.

Nadis, Fred, *Wonder shows: performing science, magic, and religion in America* (New Brunswick, NJ: Rutgers University Press, 2005).

Parsons, Christopher, *Unarmed Hunters*, (Bristol: BBC-Bristol, 1963).

Parsons, Christopher, 'The Silent Watcher', in Boswall, J. (Ed.), *Look: a selection from the BBC-TV natural history series* (London: British Broadcasting Corporation, 1969), p.13-19.

Parsons, Christopher, *Making Wildlife Movies, an introduction* (Newton Abbot: David

& Charles Ltd, 1971).

Perrin, Jacques, *Winged Migration* (Paris: Galatée Films, 2001).

Perrin, Jacques, and Mongibeaux, Jean-François, *Winged Migration* (San Francisco: Chronicle Books; Paris: Editions du Seuil, 2003).

Popper, Karl R., *The Logic of Scientific Discovery* (London: Routledge, 2002 [1959]).

Schechner, Richard, *Between theater and anthropology* (Philadelphia: University of Pennsylvania Press, 1985).

Secord, James A., 'The crisis of nature', in Jardine, N., Secord, J. A. and Spary, E. C. (Eds), *Cultures of natural history* (Cambridge: Cambridge University Press, 1996), p.447-459.

Shapin, Steven, and Schaffer, Simon, *Leviathan and the Air-Pump* (Princeton, NJ: Princeton University Press, 1985).

Taylor, Rosie, 'BBC "fakes wildlife shots all the time": Veteran cameraman claims species 'smaller than rabbits' are filmed on custom-built sets', *Daily Mail*, 9 October 2013, available online at: <www.dailymail.co.uk/news/article-2450381/BBC-fakes-wildlife-shots-time-veteran-cameraman-claims.html> (last accessed, 9/9/2014).

Weimerskirch, Henri & al., 'Energy saving in flight formation', *Nature*, Vol. 413 (2001), pp. 697-698.

Willock, Colin, *The World of Survival* (London: André Deutsch, 1978).