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Innovation = Creativity and Commercialization

CASE STUDY 1: BBC'S *WALKING WITH DINOSAURS*

HOW IT ALL STARTED

I wanted people to think that dinosaurs were real animals – not monsters. The only other place you'd see really good digital images of dinosaurs was in Jurassic Park. Our idea was to create a 'David Attenborough' of the prehistoric world.

Tim Haines, Series Producer

Tim had been fascinated by dinosaurs almost all his life and recalls, 'There was a footprint in the Tunbridge Wells Museum which I saw when I was five and I have been interested in dinosaurs ever since.' Over the years, many films have attempted to depict dinosaurs – often with rather comical results. However, the arrival of computer-aided animation opened up new possibilities, first demonstrated in the highly successful Hollywood movie *Jurassic Park*. Dinosaurs had been a neglected subject for television-makers, and no one had attempted to use the same techniques for the small screen.

Introduction to Dinosaurs

- Dinosaur – from the Greek words *deinos* meaning terrible and *saurus* meaning lizard
- Coined by British scientist Richard Owen who founded the Natural History Museum
- The first dinosaur fossils were actually identified as belonging to an extinct reptile in 1824
- The oldest, or earliest, dinosaurs found so far are prosauropods from the Late Triassic, around 130 million years ago. These were found in 1999 in Madagascar. The animals are thought to be quite closely related to the great sauropods such as *Apatosaurus* which evolved much later.
- Weighing 70 tons the *Brachiosaurus* is the heaviest found, equivalent to 14 elephants
- The longest dinosaur is the *Diplodocus* at 45 m, equivalent to five London double decker buses
- The biggest carnivore is a marine reptile called *Liopleurodon*, it is 25 m long and has a mouth 3 m wide

- The largest flying animal is the *Ornithocheirus* with a wingspan of 12 m (40 feet) and a weight of (only) 100kg
- The *Torosaurus* (horned dinosaur) has the largest skull: 2.6 m long
- In *Jurassic Park*, a company lawyer is eaten by a *Tyrannosaurus*. Scientists have worked out that it would need 238 average sized lawyers a year to keep it going
- A sauropod's stomach could hold up to half a tonne and had large stones inside it – gastroliths – to help grind down and digest the food
- A single *Diplodocus* produced about one tonne of dung per day

Tim has a degree in zoology, specializing in entomology, but went into medical journalism after graduation. From there he moved on into radio and TV, always specializing in science, medicine and the environment. He was just about to start a new series on Ice Mummies, but before that had a couple of weeks to think of new ideas, and he knew that the BBC was looking to create a landmark series. Having seen *Jurassic Park* he felt that there was a level of reality to dinosaurs that people expected which was not reflected in past or current television programmes. The technology had so much potential, yet there was a gap in the market for documentary approaches. He wanted to create a programme that could offer the same quality of special effects that had been used in films such as *Jurassic Park*, but with his programme he wanted to recreate, as far as possible, a true representation of the period – environment, flora and fauna, and so forth. His aim was to produce a documentary-like film that would make dinosaurs look like real animals. 'I came up with the idea of doing it as a natural history programme because that's how we are used to seeing real animals, but I wanted to make it with top level graphics.'

'Like anyone who sat watching *Jurassic Park*, or who has studied dinosaurs has asked themselves what they were really like, I thought, I'd love to see them alive. They are tremendous evocative creatures, quite unlike anything we have seen before.'

Tim Haines

Having identified his objective his challenge was twofold: (a) he had to consider what kind of money would be required to realize his idea – and whether it would be realistic; and (b) he had to identify some people who could actually make such a film happen. Further considerations were target audiences, viewing time, film length and, very important for the costing of the film, how much time per show of animated film he would be looking for.

SELLING THE IDEA – PHASE I

The first step for Tim was to raise money for a pilot. With the programme idea being unusual and very innovative, he felt that, to raise the money necessary to make the programme, it was essential to be able to show people what he had in mind.

Securing some finance was one thing but equally, if not more important, was to find a company who could realize the animation. Initially he contacted the people who had been involved in making *Jurassic Park*, but they quoted a production cost of \$10,000/sec. With that level of cost for animation they would end up with 3–5 minutes of

animation per 30-minute programme. This was not what Tim had in mind, and it clearly indicated that they were not really interested. It seemed that people in the US were generally more interested in film work and not TV, so the work would have to be done in the UK.

After generating a short list of companies that might be able to do the computer animations, he invited proposals from four companies. The responses from the first three were rather disappointing: Company A's suggestion was so extremely poor that it was not worth taking any further; Company B could not be bothered to respond; and Company C had changed their focus, which meant they were no longer suitable. This left Company D. The company, called FrameStore, founded in 1986, specialized in visual effects and computer animation for commercials, feature films, television dramas, video games, promotional graphics and title sequences.

'I started ringing around and I whittled it down quite quickly; there are only a handful of people who would be comfortable and capable of trying to realize this and I went round and saw several of them.'

On 8th August 1996, while still filming for the Ice Mummies documentary, Tim Haines went to meet with Mike Milne, Computer Animation Director of FrameStore, and a few of his colleagues. Mike remembers, 'In a lot of meetings we are asked to do things that are just impossible. Initially the one with Tim seemed to be one of those. It seemed that what Tim was asking for was a *Jurassic Park* for a TV documentary budget, but he was not presumptuous, as a first step he was asking us whether we had the technical expertise to do it and how much it would actually cost – but even at that point the other people in the meeting still felt it was not quite realistic.'

FrameStore won an unprecedented three consecutive Primetime Emmy awards in the late 90s for the visual effect (*Gulliver's Travels*, *The Odyssey* and *Merlin*), and since then added a further five Emmys including one in 2000 for 'Outstanding Animated Programme' for *Walking with Dinosaurs*.

However, Tim had got his timing right, Mike was fascinated by the idea and had also reached a point in his career where he was interested in moving on from the commercials he had been doing for the past years. He felt that Tim's series was something different, a piece to get his teeth into – and also something that was more meaningful. He liked the idea of a documentary, and, 'Working with researchers and scientists who all had a great aim in life – and were pursuing it for not too much money.' He knew he would desperately try to make it work. It also helped that Tim had a reputation for good documentaries and had worked with Horizon/BBC2. And finally, Tim pointed out that it would not have to be highly detailed shots. They agreed that Mike should create a short piece of animation to illustrate how he would realize the task.

When Tim went back to look at Mike's first pictures a couple of months later he was impressed. Mike, who had spent time in the London Zoo and the London's Natural History Museum thinking about the project, had also looked at some animal documentaries and realized that the level of detail was often not that great, it was often fast moving and even a bit blurred. So Mike took a misty shot of a rhinoceros and put some very simple dinosaur silhouette figures on top and then composited it in, so the actual amount of animation was quite limited. The detail of the animal was almost nonexistent and the compositing with all that mist around was fairly simple – but the picture at the end was utterly convincing. Tim knew they were thinking on the same wavelength when they met again on the 17th October. He recalls, 'The lesson was, don't throw in 500 animators and all the skin designers in the world realizing something on which you can see every scale on its body, if you don't need to. It's just as evocative to see an animal in the mist walking towards you.' That's how the cooperation started.

The very basic and short video Mike had produced was a great help in raising money for the pilot. Tim's boss bought into the idea straight away, and BBC Worldwide was quite interested too. This meant that Tim was able to raise

£100,000, which would be enough to produce a 2–3 minute pilot. Mike did not waste any time, and while Tim was seeking to raise the money he started planning for the pilot.

But not only did Mike start working pro-actively, Tim ensured that the project would move forward in his own time too. While on holiday in Cyprus over Christmas 1996 Tim shot some background footage for the pilot. In January 1997 Mike and his colleague, Andrew Daffy (now head of commercials at FrameStore), started working on the pilot. It took about 12 weeks to complete, and looking back into his diary Mike commented, 'I worked 60 days straight without a day's break during that three-month period.' The results were impressive, better than Tim had anticipated both in terms of animated time produced and visual effectiveness. 'But,' Mike says four and a half years later, 'while it was great at the time now we would hate anyone to see it.'

Once the pilot was done Mike had to sit down and work out the budget. He remembers, 'The costing for the project was based on scaling up the pilot, i.e. cost and timing for the 5-minute pilot times 6 = 30 minute for each programme, and again multiplied by 6 for the series; six times two animators would be needed plus technical staff and admin, etc.' This was quite different from how a project would normally be costed within the industry. Work in the industry would normally be based on a 'rate card,' which is generally available in all meeting rooms. It means a project is costed based on hourly rates for both people and equipment – but this would have pushed the budget far beyond its limits. So Mike went to see the financial director and together they worked out how to do it another way. One decision was to recruit college graduates rather than experienced animators, another was to get second-hand equipment. However, compromising quality of equipment was not an option for compositing. They realized that they did not have the required number of machines for compositing available, but new machines would have cost £800,000 apiece, which was out of the question. So they decided to make do with the machines available but to run them around the clock, manned with junior staff. As Mike recalls, 'We basically treated the project like a start-up.' The original idea had been to hire a warehouse for 18 months to bring the team together, but eventually it proved more workable to use a floor in the building where FrameStore was located.

The proposal they finally came up with was based on cost plus a small profit – and that was exactly how they presented it to the BBC, being entirely open about cost and profit. Tim ended up with a total cost for the series of £6.2m, including all shooting, location, puppets, sculptures, music, expenses for travel, and so on.

SELLING THE IDEA – PHASE II

The budget the BBC is willing to commit to any programme depends upon the broadcasting slot and the target audience for the programme. It also depends upon the type of programme, for example, a soap opera can be made for much less than £1m an hour – Tim needed about twice that for his series. A project of this financial scope was new ground for the BBC. However, the BBC was always looking for innovative and new programmes, and Tim was convinced, 'If we could produce the programme how we imagined it, then it would not only be very novel but also likely to attract a wide audience. The programme was not aimed at dinosaur buffs but whole families who could sit down together and watch it. This was something which the BBC was very keen to encourage.'

Armed with the pilot and budget requirements, Tim set about securing funding for the series. As Tim had anticipated, the pilot made all the difference. Alix Tidmarsh, Global Intellectual Property Director, BBC Worldwide, remembers, 'It enabled people to understand what was in Tim's head and what they would get for their money.' Or in Tim's words, 'When we showed the pilot to people they immediately understood what we were planning to do – and bought into it.'

Within the BBC fund raising did not prove too difficult. It was decided to take the idea forward because it seemed simple and achievable, and nothing like that had been done on television before. Between them BBC Broadcasting and BBC Worldwide contributed £3.5 m. In total Tim ended up with six investors: besides the two departments of the BBC, ProSieben of Germany, TV Asahi of Japan, France 3 and the Discovery Channel (US) put up money for the programme. While the level of funding was unusually high for the BBC, it still meant that they would not be able to afford more than £1 million per show – not an overly generous budget for a programme that would rely almost exclusively on computer animation.

THE DEVELOPMENT AND ITS CHALLENGES

While the fact that they had been able to gain support from television companies around the world was a great success, it also had its downside, as it meant that Tim would have to please six masters. The issues were not so much about content, that was clearly the domain of the producer, but different countries had different requirements in other respects, particularly with regards to programme length. This caused big discussions about the format of the series, i.e. how long each programme should be and how many parts the series would have. For example, the BBC would develop 30-minute programmes, commercial stations would be looking for 50 minutes of production plus 10 minutes for advertising. In the end there was no common format, but individual countries would follow what was most appropriate for their environment: in the UK the series was scheduled to run in six 30-minute sessions, the US planned to broadcast a three-hour session with scientists' comments in between, and Japan planned to incorporate its own work too. However, in the end all changes had to be approved by the BBC and individual countries were not allowed to alter the creative content of the product. It was Tim's responsibility to negotiate and give his final approval – though, as Alix pointed out, 'One has to realize that it can be very difficult if not impossible to control, in the end it becomes a matter of trust and relationships, and it is very important that everyone gets on board early and buys into the idea at the outset.'

As the team wanted to make sure that the dinosaur world came alive with as much realism and accuracy as possible, they set about the challenge to making something that was scientifically rigorous as well as being dramatic and entertaining. This meant that important preparatory work had to be done before they could start:

- The right locations had to be found
- Dinosaurs to be featured in the series had to be identified
- The time periods covered in individual programmes had to be agreed

This meant consulting with experts in the field. As Tim recalls, 'We spent a year and a half designing the storyboards. In the process we consulted over 100 palaeontologists, their area of expertise varying from dinosaur footprints to dinosaur movement to dinosaur dung, all to ensure the programmes would be informed by the latest scientific thinking. In addition, we had a dedicated palaeontologist working with us in that time, and a further seven who acted as scientific advisors – each series had its own specialist.' Before Mike and his team could go to work, Tim arranged for several of the world's leading palaeontologists to visit FrameStore to give staff a two-day intensive course.

As well as the palaeontologists, there were the palaeobotanists and palaeoentomologists and palaeoclimatologists, geologists, etc. What the team was not quite prepared for was that the palaeontologists would all disagree with each other; there did not seem to be one single truth. In the end it was about making the best possible judgement given the information available. The discussions and debates throughout the cooperation were not only educational for the BBC team. The scientific community does generally not have the kind of money that is available for television work, so scientists would otherwise not have been able to spend the amount of money and time on investigating

a particular aspect of dinosaurs, for example how dinosaurs might have moved. It was in the interest of all parties to work together to generate the best knowledge possible, because in the end it was all about testing theories that could never be proven. In addition to seeking scientists' advice, the team drew on the BBC's natural history library, making cuts of every animal documentary they found to give the animators stimulating ideas about how animals might move.

All the creatures that the team 'created' had to give a realistic impression of scale. Tim comments, 'The scale is a very difficult thing if you don't have a human there, you can't tell specific sizes. Since we couldn't put humans in, we tried very hard to get that moment of "wow, isn't he big!" through the way we designed the shots! Using low camera work and wide angles we tried to achieve a sense of their enormity.'

Walking with Dinosaurs took over three years to produce, with 18 months spent on research and two years on production. Asked how long it took to shoot a typical scene producer, Jasper James, answered, 'In terms of person-hours, the programmes took 75,000 times longer to make than to watch – the animation was the slow bit not the filming – a five-minute scene takes about four days to shoot.'

LOCATIONS AND DINOSAURS

Location was the first big challenge for the desire to make the film as realistic as possible. Finding the right locations for the filming was not as simple as it may seem. Tim explains, 'There was no grass in the dinosaurs' world and no birds (at least, none until the very end of the dinosaurs' reign), so finding places where the pictures looked right and weren't disturbed by today's local wildlife was rather tricky.' Joanna Wright, a colleague of Tim's, travelled the globe twice for about three months to find suitable film locations where prehistoric plants had survived and there was no grass, flowers or deciduous trees. They ended up with locations as diverse as New Zealand, Australia (particularly Tasmania), Bahamas, New Caledonia, Chile and California.

Over a period of 14 months they filmed in these locations for a total of 27 weeks. Jasper James, recalls, 'We were on location about one month at a time, very long hours, hard work, sometimes wonderful, sometimes horrible – nearly always uncomfortable, but the places were beautiful.' The plan was to shoot between 10 and 12 *set-ups* a day, but the schedule had to be flexible to allow for incidents. For example, on one occasion in Tasmania they had three days of heavy rain mixed with snow, and were unable to film a single frame. However, on one of their best single day's shooting they covered 26 *set-ups*. The film crew averaged ten people (in comparison, a mini series can have a crew of up to 100 strong).

Choosing the dinosaurs was simpler in comparison. While it was a long process in as much as it required the gathering and sorting of much information, they basically went for the ones that are best researched. They made sure that there was a very large fossil site underlying each programme. As Tim pointed out, 'There is so little to go on from the fossil record that we need as much help as possible!' (See Appendix I for a list of the stars of the show.)

How do you know what Vegetation was around at the Time of the Dinosaurs?

Plants get fossilized just like animals do, although those without hard woody parts tend to get preserved less frequently. Also we have fossilized dung – called coprolite – which tells us not only what plants were around but what the animals were eating! The pollen from plants, too, is often fossilized. This may sound strange, but many millions of pollen grains are produced by plants, and they also have a relatively tough coating, so they do fossilize quite well. It is possible to identify pollen grains from different plants (though not always possible to identify which plants it came from), so they can be very useful in telling what species were around when – and where.

ATTENTION TO DETAIL

Whatever was decided on, the team tried to stick to what they could reasonably predict rather than speculating wildly. They wanted to avoid any uncertain aspects. Though, as Tim points out, 'Of course the simple fact that dinosaurs don't exist any more meant that the production team faced a number of challenges! The research was straightforward enough but we encountered a huge range of conflicting scientific opinions. So, a consensus had to be reached based on the theories with the most evidence to support them.' Fortunately, many palaeontologists were happy to help because the programmes would be the first time their research would be brought to life. *Jurassic Park* had certainly been spectacular, but it had not been an accurate portrayal of dinosaur life.

With regards to details on individual dinosaurs, stature and size were probably the easiest to ascertain. Fossilized bones gave a lot of clues as to where muscles would have attached and how big each animal would have been. Other aspects were not as clear-cut, for example speed and motion of dinosaurs, as well as skin colour and behaviours. For all aspects the team sought best advice and then made the best possible decision on the knowledge gathered. For example, as to how they determined at what speed a certain dinosaur would travel, researcher Alex Freeman explained, 'It was difficult, but not impossible, to estimate the speeds of dinosaurs from their trackways. By measuring the spacing between the feet it should be possible to calculate the running or walking speed – if only we knew the length of the legs. It is rare that we can identify footprints as belonging to a particular dinosaur, but it is possible to estimate roughly the length of the legs of the dinosaur from the size of its feet! Therefore we can make a good guess at the speeds of different dinosaurs.'

Detailing the skin was another difficult issue. Initially, they tried to use photographs for the skin – but that did not work. However, in some cases they were lucky and some dinosaur skin imprints had been found which showed exactly what some dinosaurs' skin had been like. But there was no direct evidence of any dinosaur's colour, so they had to make guesses using modern animals' colours as a guide. They were also lucky in finding an expert during their recruitment process. A chap called Daren Horley rang up and asked whether they had someone to do the skin for the dinosaurs. He explained that he was a commercial artist but that he had learned everything one possibly could about dinosaurs and their skin. The BBC had originally employed a graphic designer, but the first dinosaur that had come to FrameStore had not been too realistic, so when Mike showed Tim a dinosaur painted by Daren, Daren got the job. He'd painted highly detailed skin in Photoshop, which was then pasted onto the models.

Just like the colour, sounds were very difficult to speculate about, as Tim explains, 'A little brown bird can make an extraordinary set of sounds. In the end, we created sounds that seemed to fit the size and shape of the body.'

THEORY INTO PRACTICE

In preparation for the project FrameStore decided to hire people rather than put them on time contracts, as was often done in the industry. Mike believed that after the making of *Walking with Dinosaurs* this kind of business would take off. He strongly believed this business had a future – he just knew it would be big. However, one problem was to get the right people. For computer-generated imaging there were not many skilled people in the UK. Unlike in the US, at the time no one in the UK offered proper training in that area. Mike points out, 'Computer animation is an animation job, not a computer job.' Not being able to rely on conventional avenues of recruitment he approached two people from a games company he had come across in an animation software user group. Though the games industry was generally not too well regarded in the industry, these people tend to be quite skilled at animation, work fast and know what they were doing. And, as Mike recalls, 'They were desperate to get out and get into something more meaningful. And,' he adds, 'these two turned out to be our secret weapon.' He ended up with a team of

about 30, made up of 15 computer animation staff, including nine animators, three technical support staff, one skin designer, two part-time programmers, a team of six to eight worked on the compositing aspects, putting the images together, with the remaining seven to nine working on production and administration.

The project was set-up in a completely isolated unit – one reason was to get away from 'infection'. People tended to work on a number of projects and there was always one going wrong, Mike did not want the bad tension to affect the team. Instead he wanted everyone to be 100% committed to the project, own it, feel responsible for its success and for solving problems. He wanted people to feel part of a family, of 'being in it together'. He deliberately wanted to create an atmosphere of 'us and them' in the organization – which was very much not what people at FrameStore were used to. He highlighted another reason, 'If people work on more than one project and come up against a problem that is tricky, they move onto another project and solve all easier problems first. People tend to postpone working on the most difficult tasks – at least working on the less difficult tasks gives people the sense that they achieve something. If there is only one project to work on, you cannot avoid working on the tricky problems.' Mike also decided to emulate American working conditions and divide tasks up among his team according to individual skills. Normal practice in computer graphics across Europe was for staff to become generalists. FrameStore decided that, to meet the BBC's deadline and produce the highest quality work, the team should make the maximum use of individual skill, and over the course of the project each team member became a specialist in their own area.

Walking with Dinosaurs was produced using a combination of CGI (Computer-Generated Images) and 'animatronics'. CGI means that the images come out of the computer rather than being externally generated and then manipulated by the computer. 'Animatronics' – animated models – were used for many of the close-up shots. Whilst computer graphics were good, they were better for long-distance shots. Animatronics were more realistic in close-up work, such as a dinosaur eating or drinking. Mike estimated that about 80% of the series had been done in CGI, the remaining 20% using animatronics (made by a UK-based company called Crawley Creatures). An animatronic model could take between two weeks to two months to make. The result was 20 minutes of animation per 30 minutes session; in *Jurassic Park* in comparison there were about 7–8 minutes for the entire film.

Tim drew up storyboards thinking he might have to accept that his ideas could not be realized. 'I had an ideal that I wanted to aim for, but I was always prepared to forget things and try to find another way round things. But Mike Milne and FrameStore have this foolish "can do" policy, so they threw themselves at everything we asked them to do and, as time passed, in fact the reverse happened. They would say, "You know how the script says that this dinosaur does this? Well, why don't we have him walk right into the camera?" so the whole thing fed off itself and as you are riding the crest of the wave, things just get better and better. None of us was complacent, we were all perfectionists saying, "no, we can do better" and "no, let's try that again" and that's fundamental.' Mike's praise was just as fulsome, 'Tim proved to be very flexible, he was willing to change the brief/the story if the way he initially proposed was too difficult or too expensive to do.'

'Whilst *Jurassic Park* is hugely regarded by the industry and is considered to be a benchmark in this kind of animation, we established very early on that *Walking with Dinosaurs* would be made in the style of a wildlife documentary, with the viewer watching the dinosaurs going about their normal activities in their natural habitat.'

But the biggest challenge remained how to make something unreal look real. To get an idea about dinosaur movement and behaviour, much time was spent studying existing natural history documentaries. FrameStore realized that a range of techniques would be needed to make the film look as realistic as possible. Tim explained, 'The majority of shots in a documentary have a moving camera, either hand-held, panning or tilting. These we had to create without the assistance of motion control or repeatable memory heads, this was especially difficult for several

interaction plates that needed to match seamlessly. We also gathered technical information for every shot which would be used later for creating lighting.'

THE MAKING OF DINOSAURS

The BBC commissioned three sculptors to produce highly detailed scale models of each of the dinosaurs, based on their skeletons and the most up-to-date research. These were then scanned using Soho Cyberscan, FrameStore's state-of-the-art scanning system, specially developed for the project, and which, by using a laser scanner on a robot arm, could build up an incredibly detailed and accurate image. A major challenge was preserving the skin detail of the dinosaur models without overloading the database – a challenge met by a breakthrough in programming made by team member Andy Lomas. A crude version of each character was generated to allow animators to track movements and check positions without overloading the system with too much data. Only towards the end of the process was minute detail, such as skin colour and texture, put back into the image. 'One of the fundamental needs for animators are systems that operate with enough speed to enable them to animate intuitively,' explains Mike Milne, 'SoftImage does not allow animators to switch between simple and complex images swiftly, so another of our team members, Alex Parkinson, built a system that could.'

Daren Horley, responsible for designing the dinosaurs' skin, looked at different species in detail, and found himself facing a dilemma. 'Ken Carpenter, a palaeontologist from the University of Colorado, was kind enough to leave me some casts of skin impressions from a Stegosaurus. The thing that struck me was the small size of the scales, on a large animal they would be all but invisible at a distance. I discovered that to make the scale texture show up at TV resolution I had to make them reasonably large; it became an informed compromise between what was scientifically accurate and what looked right. The BBC suggested a look that utilized a lot of colour, but I felt that we might risk a toy-like appearance and favoured a muted colour palette.'

BRINGING THE DINOSAURS TO LIFE

Putting dinosaurs into a background was not an issue, that was something FrameStore did all the time, but the question was, how to get life-like creatures with life-like movements? A first idea was to use real animals and transfer their movements to the dinosaurs, that was what Mike had done for the pilot (rhinos, elephants), but Mike felt that if only they could get the movements right they would not have to worry too much about the rest. The problem was that there were not many animals around they could use. The right people at the right time helped overcome this issue, Mike remembers, 'We were very lucky. The two people I recruited from the games industry were absolutely brilliant, they could not only make movement look just right, they were also very fast doing so. Had we not found them it could have been a big problem.'

How long on average did it take to make a fully rendered Computer-Generated (CG) Dinosaur?

On average: two weeks to build the CG model from the scanned maquette, two weeks to paint the textures, three to four weeks to animate the basic walks, runs, etc., another four to six weeks to animate all the shots, about three weeks for the computer to render all the frames, and then a couple of weeks to combine the images with the live-action backgrounds.

But even the animation of the animals was only part of the equation. The computer-generated dinosaurs needed to be placed onto live action backgrounds – and they needed to interact with the environment. So it was decided to film various bushes, trees, plants, driftwood and rocks against a portable bluescreen. Using a bluescreen would

allow the placing of individual elements together or adding aspects into a scene without encountering problems with the background. The BBC crew also scaled trees and tweaked branches with string to simulate a dinosaur's shoulder brushing against it, and threw stones into streams to create splashes where the dinosaur's feet would tread. In the studio dust clouds, splashes, water sprays, drips, etc., were also filmed against a bluescreen backdrop. All camera angles and lenses had to be measured meticulously to make sure that the dinosaur animation matched the movement in the background plates. Lighting references had to be taken (using high-tech equipment such as footballs) to ensure a perfect match for compositing.

Footage was loosely cut together, crude block animations were then placed onto the background plates to give a sense of timing, followed by the modelling and animation. Subtle effects such as reflections in water and shadows were then added and the grading matched between each shot. Once this had been completed the most detailed images of the dinosaurs were composited onto the background plates, using Inferno and Henry, and bluescreen layers were added. Simulations of hand-held camera effects such as pans and tilts were added towards the end of the process, along with other effects such as motion blur to lend realism to the shots. (For more details on the stages of the animation process, please refer to Appendix II.)

Computers and Software behind the Dinosaurs

FrameStore used SoftImage, a specialized animation software, costing about £10,000, for all modelling, animation and rendering. The combining of images with live-action was done on special machines called 'Henry' and 'Inferno' which cost nearly half a million pounds. In terms of hardware they used Silicon Graphics Octanes for the animation, dual Pentium II's for the rendering. The Octanes were not all that powerful – about 200 MHz with 256 Mb RAM – but they had special graphics boards for really fast previewing. The rendering machines had twin 700 MHz processors with 1 Gb RAM.

IF I ONLY HAD TIME...

They created a word 'blockmatic' – block out animation. Mike explains, 'It meant you had to decide two things. First, how many creatures are in the picture and second, how fast they are going to move, no more. Setting up the entire episode like that helps the producer to get a feel for the whole flow and it does not require a great creative genius to achieve that. That completed Tim would then decide what actions he would want the dinosaurs to do in each scene. The advantage of breaking it down into such steps is that they are non-threatening and achievable.' 'And,' adds Mike, 'at any time you have got something you can deliver.'

'When working in the creative industry,' Mike comments, 'it is essential to know when to stop.' Creative people tend to want to refine and refine and refine. During the making of *Walking with Dinosaurs*, Mike took the shots out from the previous day first thing the next morning and put them onto the computer. That way he knew exactly what/how much had been done. He would make the decision when something was finished, which members of the team might have argued with, saying that they would want to spend more time on a particular scene, but he had the final say. In his view it was preferable to be able to deliver than refine the product endlessly. He explains, 'One has to set limits in one's own mind as to what it is people get out of the documentary rather than getting it 100% right.' Another way to manage a huge task was to break down the creative tasks into manageable chunks. 'But,' he emphasizes, 'you need to do it all in parallel, so at any time there is a finished product and you can see it all at the same level [of quality], then elevate it to the next level, etc.'

However, seven months into the project they had still not a single episode completed. FrameStore's MD was getting really worried. Mike, on the other hand, felt that the learning from the first episode would enable them to do the rest much faster later on. They were also developing a set of behaviours that could be used in all scenes. About 1/6

to 1/10 of the scenes would be special and more detailed, but going over the same ground again and again was kept to a minimum.

When they were just about one year into the project, Mike decided to call a crisis meeting, he felt they had a serious decision to make. They had lost too much time in the beginning and were now running out of time. Mike went to the team and suggested they hire more people to get the work done. This would mean that the profit would get blown out of the window, but at least they would be able to deliver on time. The team, though, did not agree with this. Mike remembers, 'They just said, "no way, not a good idea". But the good thing was that a few days later they came back with a counter-suggestion: the existing team should split in two and just get on with it. Their argument was that they would have to spend so much time training the newcomers they might as well do it themselves. Splitting the existing team in two meant that they could work on the two most straightforward episodes simultaneously.' Though the arithmetic seemed a bit strange, it worked, though Mike admits that the quality for one of the two suffered a bit. However, on the upside, the episode for which quality was slightly compromised was set under water where the scenery was so beautiful that it did not need such high quality to have a positive impact on the viewer.

WORKING WITH BBC GLOBAL BRAND MANAGEMENT

In the late 1990s the BBC decided to respond to an increasingly globalized marketplace of television and entertainment. In 1998, about half way through the development of *Walking with Dinosaurs*, the BBC set up the Global Marketing and Brand Development Department (GMBD) to coordinate and manage products that would sell across media and globally. Part of the responsibility of the new department was to create and ensure brand consistency across the range of products developed in association with a programme.

The new department was part of BBC Worldwide, the commercial arm of the BBC whose responsibility it was to maximize revenues from BBC properties (programmes, brands) so as to generate cash to be re-invested into quality BBC programming. As part of BBC Worldwide, GMBD's remit was to coordinate and raise investment for new projects, liaise with production to develop ancillary products appropriate to the brand, and position those products effectively in market, thereby generating revenues for BBC Worldwide and the BBC.

GMBD played an essential part in realizing new productions. First and foremost, BBC Worldwide would acquire the rights from the BBC in return for its investment. Secondly, they would cooperate with production to develop a brand proposition in keeping with television and translate this into brand and style guides (see Appendix III) – this process aided the crystallization of a unique selling proposition of a production. Prior to the setting up of GMBD, such decisions would have been left to the discretion of the producer. Thirdly, GMBD tended to take a strategic perspective on the development of BBC properties. It would look to identify opportunities across new media, new channels and routes to market.

Throughout programme development the team in BBC Worldwide would also make sure that producers were aware of the commercial necessities. For example, in countries such as Japan, the use of a presenter can cause problems. The Japanese audience would not have responded positively to a British presenter and would require their own. A similar reaction could be expected in France, where the issue has more to do with the French perception that the presenter format 'talks down' to the audience. While many producers are aware of commercial necessities when developing programme content and structure, there can be a conflict between commercial and creative interests. And while this may not be explicitly expressed Tim comments, 'BBC Worldwide would rarely directly object to any project by a producer, but whether they thought it was worth it or not would be reflected in the

money they are willing to put up. In the end getting a film off the ground means ensuring that everyone's needs are met.' Paul Clarke, Head of Factual Global Marketing, BBC Worldwide, adds, 'Collaboration at all levels is the only way to ensure successful acquisition of funds for new programming and ensuring that the brand is marketed effectively.'

In the process of programme development there are two main points of contact between commercial and production: tagging meetings and the development of the concept for a production.

If and when required, commercial would call tagging meetings. During these meetings, producers present treatments (synopses of what the programme or series is about plus initial budgeting) and GMBD assess them as to their commercial value and tags those it is interested in. Evaluation criteria would include whether the programme would be likely to be transferable into more than four countries, whether it would have potential to be exploited through a range of media, i.e. video, book, merchandise, etc. and whether it would have some permanence in the marketplace, i.e. promises to be a series rather than a one-off. As Paul explains, 'To effectively market a title such as *Walking with Dinosaurs* requires significant marketing investment, and therefore you need to sustain brands for the long term rather than launch new titles every quarter.'

Before the setting up of the GMBD department, much of the interaction between commercial and production tended to rely on personal contacts and initiative. Now there were four main kinds of meetings between GMBD and production:

1. *Commercial hours meetings*: ensuring an understanding between production, GMBD and BBC public service of the demand and supply of science, natural history and history, arts and documentaries programming. Insights from the meeting would direct the allocation of investment.
2. *Editorial meetings*: between production and GMBD: allowing GMBD to preview up and coming titles and share ideas with production.
3. *Title launch meetings*: GMBD would align production with stills/specific requirements to facilitate cross-media exploitation; it would also allow production to update GMBD on latest changes to programme treatment.
4. *Title review meetings*: ongoing and *ad hoc* as necessary.

Once a treatment had been selected and budgets have been signed-off, an initial development meeting would be held between commercial and production to discuss the latest treatment, as this could change during the first phase, as well as identify stills requirements. It was important to do this early on as production used to work on these aspects towards the end, but as the production of books could have lead-times of 18 months or more, programme and related products would not be available at the same time. Early agreement on ancillary products was important for another reason: different media have different demands on the quality of images. For example, pictures for the book need a higher resolution than those for the film, which meant that additional money would be needed. It was further important to agree to time-lines, particularly as people in production would not always be aware of ancillary product time-lines, which often varied widely from those for television production.

Finally, BBC Global Brand Management would engage in the brand development and positioning. Generally this would involve the following:

- An outline on how to position the programme
- Developing a brand guide
- Developing marketing plans

Effective positioning development would rely on close cooperation between production and GMBD. By necessity this had to be an iterative process given that the ideas would initially be primarily in the producer's head and could change, especially in the early stages. The visual identity would be developed out of the brand positioning and marketing plans would be developed in collaboration with BBC public service marketing media format teams (publishing, video and DVD, etc.) and applied to international markets.

For *Walking with Dinosaurs* the process was slightly different, as GMBD did not exist when the series went into production. Alix remembers, 'The *Walking with Dinosaurs* series was started before we came into being. Half the auxiliary products had already been initiated and we were not too happy with the consistency – or lack of it – across the products.' However, in many ways the series was seen as a test case for the new approach, signifying a shift from programmes primarily driven by production to programmes developed in close cooperation with GMBD. It was a first not only in its scope of international outlook, but also in terms of developing merchandise for a factual – rather than fictional – programme.

THE RESULTS

Initially it was quite difficult to get licensees to understand the difference between *Jurassic Park* and *Walking with Dinosaurs*. The difference was not in the animation, but in the fact that *Walking with Dinosaurs* was aiming to be a documentary, whereas *Jurassic Park* was made up, beginning to end. In addition, *Walking with Dinosaurs* would not have used human beings in their film or anything else that would not have been consistent with the world in those days.

Still, there was some criticism from some palaeontologists. Though Tim Haines pointed out, '90% of the palaeontologists I talked to are delighted, and anyone who is involved in museums or institutions that thrive on public interest are also delighted. It is interesting to look at some of the criticisms from the Natural History Museum, which has used *Walking with Dinosaurs* in its advertising campaign to get people to attend. Dismissing the series as invalid, because it's based on speculation, betrays a deep-seated elitism.'

It was felt that there would have been room for improvement. Transmission in the UK was October 1999, a lot of the products only came out about 12–18 months later. Another issue with the product was that one cannot trademark the 'truth'. Had production been aware of this they could have 'personalized' the dinosaurs, e.g. a broken tooth, a scar, etc., which would have helped to brand merchandise. Had they been able to liaise with Tim earlier, they could have alerted him to that fact and individual dinosaurs would have been more trademarkable. As a consequence, BBC Worldwide has now developed a philosophy guide that clarifies unique selling points. In addition, there is a brand guide as well as a style guide that outlines how to use the logo.

Despite these issues, the series has gone from strength to strength and the results are impressive:

- In September 99, even before the first broadcast the series had generated more than £1.30m in television pre-sales.
- The series has been the 19th most popular programme ever at the BBC, and it has done incredibly well because it is not linked to any particular culture and can be translated into any language.
- In the US it broke all records; it was the highest non-sports cable programme; in spring 2000 over 40m people in the US watched all or some of the programme on the Discovery Channel.

- By December 2000 the series has had a total retail marketing value approaching £35 million and has generated more than £1.7 million in programme sales with TV deals in 22 countries; BBC Worldwide hold all publishing rights to the series, advance orders and sales of the video and books alone have already been made to the value of £1.25 million.
- By mid-2001 the series had been licensed to over 50 countries.
- By mid-2001 Tim's book had sales in the UK in excess of 700,000 and about the same number of the children's book were sold; the book had also been Number 1 in the *Sunday Times* Hardback 'General' category for two weeks.

All in all, the programme has made a turnover of more than £25m and won several awards (see Appendix IV). Tim explains the success as follows, 'TV is there to entertain. Also to educate but that is not the primary objective. On TV you want to give people relaxation and *Walking with Dinosaurs* is both highly entertaining and highly educational.' He also points out that, 'The first programme was even better than the pilot in that it was even more realistic. This was just as well as expectations had been raised through the excellent pilot. As a producer you have a problem, you want people to be excited about a programme but the more fuss people make about a programme the more the pressure is on for the producer to meet or exceed expectations.'

'*Walking with Dinosaurs* is the first major example of global brand marketing in the factual area and is, with all ancillary marketing products, pointed to become one of BBC Worldwide's top earners. It has already broken audience records for ABC in Australia and has been a massive hit in Germany for Pro7 – it is a worldwide phenomenon.'

BBC Worldwide Chief Executive Rupert Gavin

QUESTIONS

1. What are possible mechanisms for ensuring both creativity and commercial realism?
2. Drawing on both your own experience and the case study, what does it take to make an innovative project happen? [What are aspects of innovative projects (a) generally (b) in this case? How were they addressed?]
3. What are the considerations in innovating for a global market?
4. What are considerations for developing a global brand?

APPENDIX I: MEET THE DINOSAURS

Starring in each of the series:

1. New blood – 220 million years ago
 - *Coelophysis* – meaning hollow form (because of his thin bones) dinosaur; carnivore, meat and fish eating, cannibalistic scavenger
 - *Placerias* – mammal-like reptile; herbivore
 - *Cynodont* – meaning dog-toothed; half mammal, half reptile; omnivore

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- *Postosuchus* – archosaur; carnivore
 - *Peteinosaurus* – early pterosaur; insectivore
2. A time of titans – 152 million years ago
- *Diplodocus* – meaning double beamed lizard; dinosaur, herbivore
 - *Allosaurus* – meaning different lizard; dinosaur; carnivore
 - *Stegosaurus* – meaning covered lizard; dinosaur, herbivore
 - *Anurognathus* – meaning without tail and jaw; pterosaur; insectivore
 - *Orchitholestes* – meaning bird robber; dinosaur; carnivore
3. Cruel sea – 149 million years ago
- *Ophthalmosaurus* – meaning eye lizard; ichthyosaur; carnivore
 - *Liopleurodon* – plesiosaur; carnivore
 - *Rhamphorhynchus* – meaning beak snout; pterosaur; carnivore
 - *Eustreptospondylus* – meaning well-reversed vertebrae; carnivore
 - *Cryptoclidus* – meaning hidden collar bone; plesiosaur; carnivore
 - Hybodus shark – cartilaginous fish, carnivore
4. Giant of the skies – 127 million years ago
- *Polacanthus* – meaning many spined; dinosaur; herbivore
 - *Ornithocheirus* – meaning bird hand; pterosaur
 - *Tapejara* – meaning old being; pterosaur; carnivore
 - *Iguanodon* – meaning iguana tooth; herbivore
 - *Utahraptor* – meaning robber from Utah; dinosaur; carnivore
5. Spirits of the ice forest – 106 million years ago
- *Leaellynasaura* – named after daughter of palaeontologist Tom; dinosaur; herbivore
 - Dwarf allosaur – meaning strange lizard; dinosaur; carnivore
 - *Muttaborrasaurus* – named after a township in Australia; dinosaur; herbivore
 - *Koolasuchus*; named after a palaeontologist; amphibian, carnivore
6. Death of a dynasty
- *Anatotitan* – meaning giant duck; dinosaur; herbivore
 - *Torosaurus* – meaning bull lizard; dinosaur; herbivore
 - *Ankylosaurus* – meaning fused or stiff lizard; dinosaur; herbivore
 - *Tyrannosaurus* – meaning tyrant lizard; dinosaur; carnivore

APPENDIX II: STAGES OF THE ANIMATION PROCESS

Adapted from FrameStore's website (<http://www.framestore.co.uk>)

1. DIGITIZING/SCANNING

All dinosaur models in this series began life as a physical maquette. These are high detail scale models sculpted in clay, from which a resin cast is made, which are used directly for scanning and building the computer graphic models. Upon receipt of the finished maquettes, the digitizing process begins. This is represented by three key stages:

1. Preparing the maquette for scanning; which entails cleaning and then covering the model with a diffuse and optically opaque white paint.
2. Scanning, with an in-house high resolution laser scanner.
3. Data cleanup, and creating a range of digital models at different resolutions for animation and rendering.

In cooperation with Soho Cyberscan, FrameStore developed a suite of software tools, to faithfully capture the three-dimensional form and texture detail represented in the original physical maquettes. Once scanned, the model data is initially just a very large cloud of over six million three-dimensional points. At this stage the data is too dense, it has to be reduced to about one million points and linked into a polygonal lattice. A refined form is created using even fewer polygonal facets, however still maintaining the level of detail seen in the original model. Finally, a low resolution version is made for animation purposes, this enables us to see creature movement playback in real time.

2. MODELLING

When the project started there were originally 24 dinosaurs to be modelled. By the time the last episode was complete, this number had grown to 40. New creatures were introduced as the series evolved, and extra model detail was called for in some sequences.

Animation model

Upon receiving the high and low resolution polygonal models from the laser scanner, they were adjusted to the correct scale and orientation, so as to match the camera and scene data for each shot. A simple animation model is built from the low resolution scanned data. This is generally made from a series of cylindrical components.

Patch model

By carefully observing the form 'flow lines' running over the high resolution scanned data, an efficient implicit surface model is built using up to 88 patches.

Fully textured model in neutral position

Finally, capturing the fine surface detail seen in the original maquettes involved combining advanced proprietary computer modelling techniques, with the more traditional skills of an illustrator.

3. SKIN DESIGN

The process of painting the dinosaur skins began with the creation of colour designs which were sent to the BBC directors for approval. In designing dinosaur skin, various factors had to be taken into account – habitat, possible lifestyle, whether the dinosaur was a carnivore or a herbivore, and body size. The size of an animal has a bearing on its colouration; large animals tend to have dull skin colours (like elephants or rhinos), with bright colours and patterns reserved for smaller, tropical animals such as parrots or lizards. As colour pigment does not fossilize, there is no historical evidence of dinosaur skin colour; however, there is evidence that dinosaurs had scaly reptilian skin. Once the designs were approved, the skins were ready to be painted. The first step was to paint a black and white (or greyscale) image, called a 'bump map,' that the computer interprets as bumps in the surface. This creates shadows and highlights, giving the illusion of a rough textured skin.

Next a 'colour map' was painted containing all the skin colour and pattern information. These were then applied to the model. As the maps were two-dimensional images projected onto a three-dimensional model, it was necessary to paint multiple maps to cover the entire surface of the dinosaur. These were combined into one seamless map.

4. ANIMATION

Computer animation is a technique for creating the illusion of movement and life, using computer-generated characters, or in this case photo-realistic dinosaurs. The process is divided into two main parts, primary and secondary animation. Primary animation involves the main articulation and motion of a creature. Secondary animation is all the other movement, such as flesh and muscle movement.

1. After the model has been built, a 'skeleton' is constructed, which will be used for animating all the movements of the dinosaur.
2. Onto this skeleton an interactive model is built, a low detail representation of the very complicated complete model. This is done so the animator can quickly and easily manipulate the dinosaur. The creature can then be animated by moving and rotating different 'bones' or joints. Now that the skeleton and interactive model are created animation can begin.
3. With the help of the BBC a library of live action wildlife reference material was built up, which was used to help form ideas about the kind of movements and behavioural characteristics the dinosaurs would have. The first stage is to get the dinosaur walking. This initial animation helps visualize the animal's weight, size, posture and character. Each 'bone' is then individually animated to create realistic, fluid movement.
4. In a process called 'enveloping,' the final model is attached to the animation skeleton. A walk cycle for the complete dinosaur is then rendered on a 'turntable' so that the skin and movement can be fully tested.
5. Extra 'bones' are added (ribs, for example). These make sure that skin, muscles and wobbling fat behave correctly. Finally, eye blinks and breathing are added, these small details really help bring the creatures to life.

5. LIGHTING AND RENDERING

Once the animation is completed for a shot it is ready to light. Lighting involves illuminating the computer-generated scene with virtual lights, to match the direct and ambient light in the live-action backplate(s). This is first accomplished by using survey data and reference information collected on location at the time of filming. Range data enables the

setting up of a virtual camera and set its position. Reference frames of a 'lighting-ball' are filmed at the same time. Using a 'lighting-ball' it is possible to understand the proper direction and intensity of the dominant light sources in the scene. After carefully balancing the virtual lights to match the graded live action scene, the shot is ready for rendering. As part of this project proprietary methods were devised to maximize render throughout, but to also offer complete flexibility over lighting balance and shadow density, right through to the final composite. This enabled the generation of over 28,000 frame elements in one 12-hour period.

6. COMPOSITING

Computer-generated 3D elements are rendered to tape, with up to five layers for each creature. These consist of a colour, form, shadow, highlight and secondary shadow passes (as shown below). Each layer is added one on top of the other, and at each stage careful adjustments are made to ensure that the dinosaurs' shading and shadow density match those of the live action background plate. At this stage bluescreen elements such as extra tree ferns, rocks and other foreground items are added.

When colour grading underwater creatures, the colour saturation decreases with depth. By using a 3D depth matte, a creature can be made to appear and disappear from the blue depths. For the larger land-based dinosaurs we were also able to control the depth of field along the length of their bodies. The team of five Henry and five Inferno compositing artists produced over 1000 shots.

7. MASTERGRADE

When all the compositing is finished the final shots are dropped into the edit. In telecine any final 'look' or matching of colour balance is carried out. It was decided to make *Walking With Dinosaurs* 'future protected'. This means safe for 4:3 and 16:9 widescreen viewing. The plates or backgrounds were shot on 35 mm film 'open gate'. This gave us excellent steadiness and detail. Prior to *Walking with Dinosaurs*, almost all documentaries were shot 16 or S16 mm, which was felt not to be high enough quality for this project. The film master was finally transferred to digital tape as '16:9 anamorphic'; this is then unsqueezed at the point of broadcast.

APPENDIX III: EXCERPT FROM BRAND GUIDE

Brand positioning

- the real-life experience with the most extraordinary creatures that ever lived

Brand substantiators

- travel back in time and watch living, breathing dinosaurs in their natural habitat
- it feels completely real; a primeval environment is created by leading-edge computer technology, animatronics and footage from locations around the globe where ancient plants still survive
- story-led programmes which show us the anatomy, life-cycle and behaviour of dinosaurs – familiar favourites like *Tyrannosaurus Rex*, as well as less familiar creatures like *Liopleurodon*, the world's largest carnivore at 25 meters long

- the latest palaeontological theories on the magnificent prehistoric animals which roamed the earth for 160 million years

Target audience

- broad family appeal – adults and children alike
- everybody who loved *Jurassic Park*
- everybody with an interest in natural history or palaeontology

How does it make me feel?

- Wow, that was amazing
- I feel I could reach out and touch them. . . the detail is fantastic
- When you see the dinosaurs in the forest crashing through the trees, splashing in the water, chasing insects – it's like being on a dinosaur safari

Brand values

- real, captivating, cutting edge

Associated products

- home videos
- adult trade books
- children's books (photo book, sticker book, Q&A book, 3D poster book)
- DVD
- Music CD
- Merchandise
- Online site

APPENDIX IV: AWARDS AS OF 30th OCTOBER 2001

WALKING WITH DINOSAURS – THE PILOT

- Prix Pixel-INA Monte Carlo 1998 'Content Graphics'
- London Effects and Animation Festival (LEAF) 1997 'Education and Training Award'
- Australian Effects and Animation Festival 1998 'Education and Training Award'
- CGIX Amsterdam 1998 (category not recorded on the award, and I can't remember!)

WALKING WITH DINOSAURS – THE SERIES

- 3 Emmys (US)
 - Outstanding animated programme
 - Outstanding music composition for a mini series, movie or special
 - Outstanding achievement for non-fiction programming – sound editing
- Royal Television Society – team award for *Walking with Dinosaurs*
- BAFTA – innovation award; also nominated for the Low Grade Award (voted by readers of *Radio Times*)
- Voice of the Listener and Viewer Awards – best new television programme
- London Effects and Animation Festival (LEAF) Gold Award 1999
- Royal Television Society Craft and Design Awards 1999/2000 'Design and Craft Innovation Award'
- Royal Television Society Programme Awards 1999 'Team Award'
- Creative Freedom Awards 2000 'Factual Television Programme Award'

FRAMESTORE

- 2001 Outstanding Animated Programme: *The Ballad of Big Al*
- 2000 Outstanding Visual FX: *Walking With Dinosaurs*
- 2000 Outstanding Animated Programme: *Walking With Dinosaurs*
- 2000 Outstanding Main Title Design: *The 10th Kingdom*
- 1999 Outstanding Special FX: *Alice in Wonderland*
- 1998 Outstanding Special Visual FX: *Merlin*
- 1997 Outstanding Special Visual FX: *The Odyssey*
- 1996 Outstanding Special Visual FX: *Gulliver's Travels*