

In 1996, when **Jurassic Park** was doing wonders for box office and SFX but nothing for palaeontological credibility, BBC Producer and entomologist Tim Haines had "The Idea". Why not go the whole hog? Blend the Beeb's outstanding reputation for wildlife documentaries with Britain's finest SFX capabilities, season the mix with the latest scientific knowledge and bring fully credible dinosaurs to the TV screen.

BBC1 and BBC Worldwide funded a pilot so successful that it attracted a drama-size (£6 million) budget to cover six 30-minute episodes and the backup. Programmes must faithfully emulate the Attenborough genre, be shot and edited as wildlife films with voice-over but no on-screen presenter, showing dinosaurs moving, hunting and surviving amid contemporary Mesozoic vegetation. *Nothing more recent must appear on screen.* Now entitled **Walking with Dinosaurs**, the series started showing on BBC 1 this autumn, together with a 50-minute sibling documentary on "The making of" to validate its scientific accuracy. It will be shown on the Discovery Channel in April 2000.

Three-pronged preparatory research filled the first year and, as the Dinosauria dominated Planet Earth by land and sea from pole-to-pole for 160 million years, there was much ground to cover. A palaeontologist assembled species data. A botanist was set to identify and recce sites where contemporary plants not only still existed but could be filmed *without any grasses appearing*. Grasses are more recent growths. Finally a zoologist correlated modern animal evolutionary trends for linking with the fossil record, to indicate probable behaviour patterns of the long-dead animals. "Our aim?" said Tim. "When people ask 'is this really how they looked?' was to allow us to reply, 'nobody knows, but this is the best guess going'."

This commitment to scientific accuracy means that although some 'favourites' appear – including

Filming in the forests of time



Shooting in Caledonia: (from left to right): John Howarth, Director of Photography; Keith Broome, Assistant Cameraman; Jamie Campbell, Physical Effects Director; Richard Gregory, Animatronics Designer – wearing a large dinosaur on his arm.



John Howarth, Director of Photography, in Chile.

"There were 1200 shots on the storyboards and we shot a background plate for each one . . . That's 1200 SFX"

Tyrannosaurus Rex – many of the species appearing are less well-known but have a richer fossil history to allow accurate 3-D replication. This CG process starts with a 12-18 inch (30-45 cm) top-quality sculptor's clay model for palaeontological approval. A resin cast is made, surface textures are added, and the whole construct then computerised. From this is produced the traditional simplified 'wire-frame' image on which animators work their painstaking wonders before compositors restore the 'skin and wrinkles'. Designers of the animatronics models, also needed

in the series, draw from the same data-bank, and add their own special magic in manufacturing the working models – some whole animals, some just heads and necks.

Filming the authentic vegetation for backgrounds was something quite different – and is dealt with later. First – how will these ingredients be combined? "The 50-minute documentary," said Tim, "will underwrite our scientific rectitude, but the larger Attenborough-trained audience will need a story. If they do, then I do. We provide a story and excitement in each episode. We didn't want to be the people who made dinosaurs boring.

"With no real animals to coax we could storyboard each episode and plan location shoots knowing – weather permitting, which it often didn't – precisely what we had to do. Most unusual. Our only limitations lay within Framestore's computer-graphics and Crawley Creatures' animatronics. We explored their boundaries by asking for the earth and seeing what each would accept. They were a wonderful combination; between them they managed about 99% of what we wanted. It was very liberating not being restricted by the technology. In general Crawley's animatronics were used when we got really close-in; when we wanted the animals to sip water, tear a piece of flesh, or where there is physical interaction. Framestore took the wide-shot animation, compositing and replication."

A worldwide botanical search by botanist and researcher identified seven locations – Australia, Bahamas, Chile, California, New Caledonia, New Zealand and Tasmania – which were covered in eight separate, but occasionally back-to-back, shoots of typically 2-3 weeks' duration between

"It mustn't get too beautiful and lose credibility"

► In New Zealand (from left to right): Jez Harris, Animatronics Supervisor – wearing a small dinosaur on his arm; Peter Thorn, Assistant Cameraman; John Howarth, Director of Photography.



autumn 1997 and January 1999. For the travelling crew, typically 10 strong, it wasn't just storyboards that made it different. Practically everything else was also different. As all the plants – survivors over aeons of time – were rare, none was easily reachable. Helicoptering was commonplace. So was the walk from landing to campsite carrying supplies for, say, five days camping. Carrying *everything*. Tim Haines and Jasper James shared production, there was a consultant botanist, usually two on animatronics, two on CG, a stills photographer and the physical FX man who "could rig anything". Excepting in the Bahamas, where Mike Pitts shot the sub-sea scenes, all filming was done by John Howarth and an assistant. Just the two.

John, a long-time BBC man in Manchester, Cardiff and Ealing, now freelance and one of Britain's most experienced documentarians, takes up the story. "I spent 15 months filming slightly-out-of-focus trees on Super 35 to get maximum data for subsequent CG work for a 16:9 widescreen finishing format. There were 1200 shots on the storyboards and we shot at least one background plate for each, however similar they were. We could then always make a pass across three or four adjacent plates if we wanted a pan shot." That's 1200 SFX.

"My major problem was focusing on an animal which isn't there, but will be added later. Hence the constant Framestore presence to record the distances, angles, tilts and so ensure everything would come together in the computer that calculates what space it has to create the animal in. I'm used to 16mm and on a real wildlife job like this, I would use a zoom. Primes can

be tricky if you want to correct when you see the wrong things coming into shot. The CG specialist much preferred primes and for good reasons. I wouldn't be tempted to instinctively creep in to improve a shot – especially in a helicopter! – and change from the chosen lens size. Here, we could always shoot again. Before leaving I shot a grid with each lens to identify any distortion. This was computerised and incorporated in compositing software so that when the virtual animal 'walks' across the image from that lens it, too, is distorted accordingly. Further additional clever software ensures that the animal can be followed by a moving camera. We even used that on some handheld stuff too, with the bigger animals. And 35mm is pretty similar to 16 – just heavier. Happily I made the great discovery of the Lowepru rucksack. With this I could take all my lenses – a full set of primes and a 300mm on my back. This allowed me to cradle the 435 in my arms whilst walking uphill and crossing waterfalls.

"Stocks? All daylight; I mostly used EXR 5245. I'm a huge fan. I've used it since it came out. There's no reason not to. Why use an 85 filter if it's unnecessary? Something else to forget, or give an unwanted internal reflection. In the forests, I knew I'd be working on about 2.8 so I'd have to use 5246 – Vision 250D. That doesn't give me a lot of depth but remember we're shooting on 35mm with the best stocks available and aiming to make it look like a 16mm documentary. If it looks like a glossy drama we've failed.

"I said that things were different. A lot of our shots were locked off but when the CG people had composited they added that little bit of wobble

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"We didn't want to be the people who made dinosaurs boring"

that you get with a long lens on a tripod. It mustn't get too beautiful and lose credibility and its easier to do the whole frame in one go. We shot a lot of footage on the Pterosaurs, the fliers, on a 1000mm lens which, on a 35mm camera is the rough equivalent of the 300mm or 600mm on a 16mm camera – which is what people will expect to see. That got the wobble treatment too."

Film data

John Howarth has covered a wide spectrum of work which has taken him to over 70 countries on six continents. He has travelled by horse and by camel, by cruise liner and by canoe, and sometimes, by the only way to go – walking. He has filmed from helicopters, light aircraft, gliders, balloons and . . . from the ground. Among his credits, he includes:

Earth Story

The Secret Life of Twins

Zulu Wars

Under the Sun: A Caterpillar Moon

Encounters: *Lost in Africa*
Fire Mountains

Timewatch: *Sold Down the River*
The First Intifida
Savagery & The American Indian

Phantom of the Operetta
The Face of Tutankhamun

Production team

Walking with Dinosaurs

Executive Producer and Director	John Lynch
Series Producer and Director	Tim Haines
Producer and Director (Episodes 3 + 4 only)	Jasper James
Director of Photography	John Howarth Michael Pitts (Episode 3 only)
Assistant Cameramen	Peter Thorn, Keith Broome (Episode 1 only)
Physical Effects Animatronics Supervisor	Jez Harris
Director of Computer Animation	Mike Milne
Visual Effects Supervisors	Mike McGee, Tim Greenwood Andrew Wilks
Editor	Framestore
Computer Animation and Post-Production Animatronics	Crawley Creatures and Associates