



BRINGING THE PAST TO LIFE

Can a stage spectacular based on a TV documentary bring science to life and please the punters too? **Brendan Maher** joins a palaeontologist to watch the dinosaurs walk.

As the seating in the arena slowly fills up the children can't hide their giddy anticipation. Neither can Ken Lacovara, chattering away about dinosaurs and digs. Admittedly, he has a soul patch on his chin, a beer and a couple of graduate students, which marks him out from the majority of enthusiasts here to see *Walking with Dinosaurs: The Live Experience*. But there's no mistaking the kinship between the professor of geology and palaeontology from Drexel University, Philadelphia, and the children around him. "Everybody I know in the field wanted to do this since they were very young," he says, looking around. "You never know what future scientists might be in the audience."

The stage show now touring America — watched by *Nature* and Lacovara at Philadelphia's Wachovia Spectrum sports arena in August — was inspired by the BBC documentary series, which, according to Lacovara, set a gold standard for edutainment (see 'Origin of a Species'). Using computer animation, animatronics and the authoritative tones of the actor Kenneth Branagh, the series told the tale of the dinosaurs' 160-million-year

lease on Earth. The programme was stunning to watch yet stuck close enough to scientific understanding not to upset an expert. At least, not Lacovara. The \$20-million stage show has a lot to live up to, and Lacovara's excitement — especially over the prospect of a fully fleshed-out brachiosaurus — is tinged with scepticism. How well can a theatrical presentation relay natural history? Will spectacle triumph at the expense of information?

The house lights dim and a booming voice reminds the crowd that, as cell phones and pagers didn't exist 65 million years ago, they should be turned off. Score one for realism. 'Huxley', a palaeontological P. T. Barnum strides on to the stage to serve as our guide and scale bar. He bends down by a nest from which plateosaurus hatchlings emerge, in the form of squirming green hand-puppets. The eggs, Lacovara notes, aren't shaped quite right — too "chickeny" — but his criticism is cut short by lilliensternus. A two-metre-tall carnivore enters the arena. Actually, it's a suit worn by an

actor with the mettle to carry 40 kilograms of foam, lycra and animatronics on his back and yet still look nimble. Once you learn to ignore the craftily camouflaged extra set of human legs, it's pretty convincing.

In the interest of conflict, a full-grown plateosaurus appears next, eager to defend its babies. This large dinosaur is a puppet, operated by three people. One drives a slim car camouflaged beneath the dinosaur; two others are in a control room moving its neck, tail, jaws and the like by manipulating a smaller version, evocatively known as a voodoo rig. Prosauropod and predator settle into a carefully choreographed stand-off. The slow, deliberate tempo

"Prosauropod and predator settle into a carefully choreographed stand-off."

is the result of much trial and error, Matthew McCoy, the head of puppetry, later explains. McCoy tells the tale of a tragic show in Sydney, Australia, in which *Tyrannosaurus rex*'s head fell off after a tight turn at high speed. The audience was sympathetic, he says with some gratitude, but the troupe learned its lesson.

In addition to slowing down the action in

T.S. WARREN/AP

Origin of a species

Would you expect to see your first dinosaur on a dig, in a museum — or at a cocktail party? In 2003, William May, the artistic director of the stage show *Walking with Dinosaurs: The Live Experience*, invited a collection of socialites and friends to his workshop, Number 12, Elizabeth Street, Kensington, Melbourne, Australia, a converted wool warehouse and tannery decorated with trolls, fairies and other larger-than-life puppets from May's theatrical exploits. As they were sipping wine and nibbling canapés, a 14-metre *Tyrannosaurus rex* burst in. Fashioned from a mechanical crane with garden-hose ribs and Lycra skin, the first prototype for the show now touring America debuted in style.

When the BBC first approached May and his business partner Malcolm Cooke earlier that year with the challenge of creating a stage version of its acclaimed TV documentary, May knew that no cartoonish facsimiles would do. The only way forward was to use full-scale models, a technical challenge that launched him into two years of research. From the size, balance and gait to the skin, teeth and eyes, everything had to be not only as technically accurate as possible, but absolutely stunning to the audience. "Can you bring dinosaurs back to life in the most realistic form that could tour the world, beat the most cynical child, beat the scientist, beat the reviewers? It's like going to the Moon."

Brooklyn-born May says he's always lived by the motto that he could make anything happen if he put his mind to it. Practising ballet in secret in his bedroom as a child, he grew to become one of the youngest producers of musicals on Broadway. There, he learned to bring imagination to life through puppetry and animatronics.

Dealing with scientists was a change of pace, he says. "I love science. You get to meet the most brilliant minds." But as the dinosaur's drinks-party debut demonstrated, he's a showman at heart.

"The future of theatre won't come from song and dance but from pushing boundaries. Audiences are very discerning now; they play computer games and watch movies with computer-generated imagery. This isn't a film, or a trick, this is an emotional, real experience."

Julie Clayton and Ruth Francis

Listen to William May and Ken Lacovara discuss dinosaurs on this week's Nature podcast (www.nature.com/podcast)



Head to head: palaeontologist Ken Lacovara in a montage with dinosaurs used in the performance.

later shows, the team built a spare *T. rex*. With 15 dinosaurs taking the stage every night, losing one wouldn't necessarily stop the show, but turning up in front of hundreds of children without a working *T. rex* just doesn't cut it. "We might as well just go home," says McCoy. There are contingency plans for other disasters, too. Had lilliensternus been toppled by plateosaurus's heavy whiplike tail, for example, he would have needed help getting back up. That, says McCoy, is when they send in the dinosaur clowns.

No disasters strike in Philadelphia. After several minutes of a mock battle and trotting about, lilliensternus and plateosaurus dutifully leave the stage, and Huxley eases the crowd through geological time into the Jurassic period. Bright inflatable plants explode around the stage. Lacovara gleefully elbows one of his students; he thinks giving a round of applause to the Jurassic just for starting is pretty amusing.

With the Jurassic period come the brachiosaurs. The young one is perhaps two storeys tall; the adult, more than ten metres. They make an impressive pair as they stretch their long necks deep into the stands, delighting the audience. As one of them almost lays its head in Lacovara's lap, he notes that a full-grown adult would have been a bit taller, but he's still impressed. The palaeontologist on stage rattles off statistics about the beast, which may have weighed as much as 40 tonnes. The expert in the stands notes, with a mischievous grin, that the titanosaur his group is excavating in Patagonia weighed 60.

But despite a little professional one-upman-

ship, Lacovara likes the show. During the intermission, he confers with his students, who agree that it doesn't pull any educational punches. "It's just packed full of content," Lacovara says, noting that it introduces concepts such as deep time, plate tectonics, climate change and evolution: all ingredients, he says, that presented too dryly would spell certain death.

This concept brings us ineluctably to the show's finale. In the climactic Late Cretaceous, rife with volcanic drama (cue the light show), a *T. rex* mother and son take the stage triumphantly. After some play-fighting with ankylosaurus and torosaurus, they turn their attentions to the crowd. While baby *rex*, another actor in a heavy dino suit, mugs for the crowd, mum is scaring the life out of them. A blonde boy just behind Lacovara chats nervously with his father about the seating arrangement as the *T. rex* approaches. "No Daddy, don't tell him I'm here."

A bright strobe with booming audio represents the extraterrestrial *coup de grâce* at the end of the Cretaceous. The dinos exit, the plants deflate, and bows are taken. The crowd drains from the Spectrum, and the children are laden with bright and blinking palaeoparaphernalia. After three more shows, the crew will pack its 27 truckloads of equipment and move on to the next stop. Lacovara is beaming, satisfied with the production's portrayal of the work he does. Dinosaurs, he says, are "a gateway drug for the sciences". A lot of kids scored tonight. ■

Brendan Maher is a features editor at Nature.

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— Matthew McCoy