

Science in culture

Womb with a view?

All is not as it seems in a television programme on the life of a fetus.

Martin Kemp

We tend to believe what we see, provided that the image obeys certain rules of internal consistency. Although we have plenty of evidence to reject the old adage that the camera never lies, particularly in this era of digital manipulation, we are perceptually prone to trust a representation that exudes an air of the 'real thing', especially if it has a photographic look. Illustrators therefore have an ethical imperative to use their skills in the service of a contract of trust with the viewer. With recent advances in computer graphics, these issues of trust have assumed a heightened urgency.

Film-makers have access to techniques that can render in compelling detail interactive hordes of warriors using just a few real actors. That's entertainment, they say. But exploiting computer-generated (CG) imagery in public science broadcasting is quite another matter.

Visual images can now convey the unseeable in brilliant colours and with wondrous spatial conviction, whether they are great arrays in the cosmos or molecular engineering. Such images are clearly a good thing in the communication of science. However, the viewer is frequently not told about the status of the images. When they relate to matters of considerable emotional and social importance, the stakes in the contract of trust can be huge.

On our screens we see a beautiful picture of a four-month fetus, yielding nothing in pink-appeal to a Raphael bambino. The fetus wheels slowly in space, apparently expressing feelings through its gestures and expressions. A voice-over intones some syrupy poetry, apparently composed by



the precocious infant through the adult medium of poet Roger McGough. We are told that the images come courtesy of new 'four-dimensional' (4D) scans (three dimensions plus real time).

This is what we were shown in the two-hour programme *Life before Birth*, made in Britain by Pioneer Productions and directed by Toby McDonald. The film was screened in Britain as *In the Womb* on the National Geographic channel on 11 March and on Channel 4 on 9 April.

There were some glimpses of relatively raw scans, but most of the spectacular visuals relied on animated models made by Middlesex-based company Artem. The fetuses were sculpted in wax, cast in silicon and hand painted. Animation specialists MillTV — better known for special-effects work in the film *Gladiator* — then set the models in motion. The skill and imagination behind the models were of the highest order, and the

results were seductive, visually and emotionally. We felt that we were eye witnesses to a beauty and conscious life previously unseen.

But at no stage was it clear what we were seeing. The credits named the companies responsible, but did not explain how the images were generated, and they were all implicitly accorded the same level of 'visual truth'.

Only on MillTV's website is the process made clear: "After months of research, courtesy of 4D ultrasound scans, medical books and pictures of mummified fetuses,

MillTV developed anatomically accurate CG recreations of month-four and month-seven fetuses." Each elaborate and laborious animation involved such methods as "multi-layering" for "shadowing, depth of field and colour correction flexibility".

In an area of medicine where public feelings run violently high, more honesty is required if the contract of trust with the viewer is to be honoured. I should like to propose a law and a consequent rule. The law is that the greater the skill available for making utterly convincing and seductive images, the greater is the power of potential deception. The rule is that the more sophisticated the techniques, the greater is the responsibility for openness in explaining how the images have been generated and where they stand in relation to the raw data.

Martin Kemp is professor of the history of art at the University of Oxford, Oxford OX1 1PT, UK, and co-director of Wallace Kemp Artakt.

An autistic look at animals

Animals in Translation: Using the Mysteries of Autism to Decode Animal Behaviour

by Temple Grandin & Catherine Johnson
Scribner/Bloomsbury: 2005. 368 pp.
\$25/£16.99

Marian Stamp Dawkins

There are two remarkable things about Temple Grandin. The first is that she has arguably done more than anyone else in the world to improve the welfare of animals in a practical way. Her major contribution has been to go into places that most of us would probably prefer not to think about — slaughterhouses — and imagine what it would be like to be an animal on its way to being killed. She has dramatically improved the welfare of these animals, not by making



An eye for detail: Temple Grandin believes her autism helps her to see things like a cow does.

any expensive modifications to the slaughter plants but by suggesting simple changes that cost nothing, such as removing a yellow coat hanging over a grey fence, or altering

the lighting to eliminate shiny reflections from a puddle. By removing stimuli that frighten cattle and cause them to stop and pile up on one another, the cattle move more easily, they don't slip and fall, and the use of electric goads is almost unnecessary. These things are all very simple and effective. It's just that no one had thought of them before.

The second remarkable thing about her is that she is autistic.

In *Animals in Translation*, Grandin argues that these two things are intimately connected. Her autism, she believes, gives her a remarkable insight into the way animals see the world. Animals, like autists, concentrate on detail. It is obvious to her that the yellow coat would be a scary stimulus to a cow, but the rest of us, concentrating on the bigger picture, would simply not realize unless it was pointed out to us. If Grandin's claim that her autism helps her to see the world through the eyes of other species sounds far-fetched, we have to remember her

phenomenal success in making a difference in practice. Millions of animals are now moving through slaughterhouses more calmly because of what she has seen through her autistic eyes.

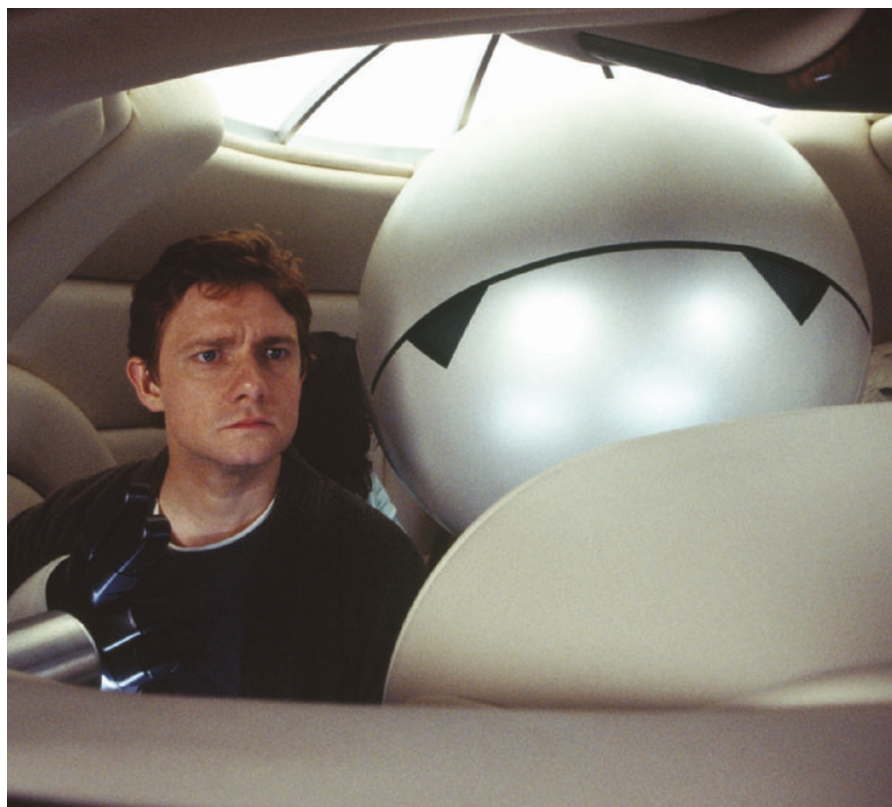
In some ways, this book is profoundly shocking, or at least it would be if it were not written by an autistic. "Autistic people are closer to animals than normal people are," she writes. "Autistic peoples' frontal lobes almost never work as well as normal people's do, so our brain function ends up being somewhere in between human and animal." Imagine anyone else saying that and getting away with it. But part of the power of this book is its innocence (her word too) and its genuine insights into a completely different way of thinking and seeing. Political correctness is not part of her world.

Grandin also states categorically that she doesn't have an unconscious and cannot repress unwelcome thoughts or emotions. This is one of many areas in which she has difficulty understanding normal people. She cannot understand why they deny what seems perfectly obvious to her, such as that something isn't going to work or shouldn't be said because it would offend people. Hearing her side of the story is a bit like being introduced to another culture by someone from that culture who has taken the trouble to find out which bits you are going to struggle to understand. Grandin straddles two worlds and, remarkably, can operate in both. If we want to understand her world, some of our preconceptions about what can and cannot be said will also have to be toppled. Being shocked out of our usual way of thinking is part of the process of understanding what it is like to be her.

At times, it is difficult to work out whether this is a book about animal behaviour with insights from autism, or a book about autism that uses animal behaviour to explain what it is like to be autistic. A major achievement of the book is that is both, and it should be read as such. If you disagree with some of the things she says about animal behaviour or brain function, you keep going because of the fascinating insights you are gaining into her experiences as an autistic; and if you find yourself disagreeing with what she says about autism, you have the testimony of a unique human being about her life with animals.

Catherine Johnson has put Grandin's words into a form that is accessible to readers without any prior knowledge of either autism or animal behaviour. At the same time, people working in these areas will be given insights into the connections between these apparently diverse fields that will stick in the mind and change the way we look at both. ■

Marian Stamp Dawkins is in the Department of Zoology, University of Oxford, South Parks Road, Oxford OX1 3PS, UK.



Guided tour: Arthur Dent and Marvin the Paranoid Android hitchhike through the galaxy.

Don't panic!

The Science of the Hitchhiker's Guide to the Galaxy

by Michael Hanlon
Macmillan Science: 2005. 256 pp.
 £16.99, \$24.95

Joanne Baker

Your brief: to explain the science of Life, the Universe and Everything. It's quite a challenge. But Michael Hanlon pulls it off with wit, energy and style.

Timed to coincide with the release of the film adaptation of Douglas Adams' famous book series *The Hitchhiker's Guide to the Galaxy*, Hanlon's guide to the *Guide* takes the general reader on a grand tour of the outer reaches of modern scientific reality. Alien life, quantum physics and the history of the Universe are just as mind-boggling and weird now as they were to Adams in the 1970s, when he imagined Arthur Dent's escapades. Hanlon even manages to explain the unexplainable, such as the eye-popping shock of the total-perspective vortex.

Hanlon obviously enjoyed writing this book. It's not often that science writers get to rant about the non-existence of God, to explain the sudden appearance of a whale from a quantum fluctuation, or to ponder the genetic modification of animals to produce guilt-free meat. Adopting Adams' witty, punchy style, Hanlon's guide is a fun and vivid read. The science twinkles a little

more than usual in such a zany setting.

Although he tackles a wide range of cutting-edge topics with depth and authority, Hanlon has chosen the most obvious Hitchhiker destinations for his own scientific tour. The Restaurant at the End of the Universe prompts a discussion of the fate of the Universe; the babel fish yields a chapter on translation software; and time travel, parallel universes and black holes are well-trodden avenues. But when Hanlon does venture off-piste, he is a reassuring and insightful travelling companion, even if he often leaves the *Guide* behind. More references to it and amusing quotes could have added to the entertainment.

Readers familiar with the original *Hitchhiker's Guide* might have enjoyed more subtle tie-ins and a little more background about Adams himself, his peculiar ideas and influences. Hanlon briefly sets the context, but leaves such dialogue to others. The book also lacks comparisons with other contemporary science fiction. Aimed fair and square at the popular-science market, Hanlon's book may not satisfy die-hard science-fiction buffs. But the ghost of Adams is lurking in the pages.

See the film and buy the books. Don your striped jacket, bathrobe or spare head, and keep a towel handy. And above all — Don't Panic. With Hanlon's quirky book you are in safe hands. ■

Joanne Baker is in the Astrophysics Department, University of Oxford, Denys Wilkinson Building, Keble Road, Oxford OX10 3RH, UK.