Interview with **VILAYANUR RAMACHANDRAN**

An artful brain

TOM STAFFORD *(University of Sheffield) meets renowned neuroscientist* **VILAYANUR RAMACHANDRAN.**

IN person, Professor Vilayanur Ramachandran has the same energy and charisma that made his 2003 Reith Lectures so popular. Originally trained as a doctor, he came to neuroscience via neurology. His experiences with neurological patients, including his pioneering work on phantom limbs, are related in his first book *Phantoms in the Brain*. He is currently Director of the Centre for Brain and Cognition at the University of California, San Diego, and Adjunct Professor of Biology at the Salk Institute.

In his latest book, *The Artful Brain*, he discusses the cognitive, neurological and evolutionary basis for our appreciation of visual art. His argument is that aesthetic appreciation taps processes that are functional parts of the structure of our sensory systems. Just as some illusions can reveal aspects of visual processes, art has unconsciously converged on patterns that take advantage of basic principles that are designed to allow us to make sense of sensory input. He has proposed ten universal laws of aesthetics deriving from the way the brain functions (see box opposite, and further reading for more). For example, his second law, 'grouping', refers to the tendency of the visual system to try to unite items into coherent objects. Many psychologists will be familiar with the 'gestalt grouping principles', and the evolutionary advantage they convey for being able to perceive objects is obvious. With art, the argument is that the need to discover objects has become designed into very basic functions of the visual system. We are motivated to make sense of the world and so to find perceptual problem solving intrinsically rewarding. Aesthetic pleasure exists because works of art activate this principle, and others, in interesting ways.

I caught up with Professor Ramachandran on the second day of the Winchester Festival of Art and the Mind, immediately after he had taken part in

a panel debate in which he expounded on some of the more reductionist elements of this 'neuroaesthetic' approach.

When you explain your theory on the aesthetics of art what kind of reaction do you get, especially from artists?
Typically, the scientists like it. They say, 'Finally we're explaining everything, including the arts: we're bridging the gulf between science and art.' But they realise it's sort of tongue in cheek, just scratching the surface. We're just providing a framework – a place to start. That's too often true of science, of course!

But what amazed me was that the artists lap it up, by and large. I have many artists coming up to me and most of the time saying, 'Oh my God, this is all wonderful because it legitimises what I do. Finally I realise I'm not crazy. It all makes sense, I know what's going on in my brain.' They then start trying to fit the laws to their own sculptures, their own paintings. Most of the time.

It's the art historians who get riled up. For some reason they assume – incorrectly – that this somehow undermines their whole existence. Which it doesn't. Just saying there are universal laws doesn't mean that art history is not valid. I've said 95 per cent of art may be driven by culture – but that leaves 5 per cent and it's the 5 per cent that very few people study, the universals. That's what I'm interested in. But that doesn't negate art history, or say that there are no different artist styles. There is a fear of reductionism. But if you explain something, you don't explain it away.

One thing you said in the introduction was that art might be nature's first attempt at virtual reality, that art might be an augmentation of our imaginative capacity.
Correct. I think that even now our imaginative capacity is very limited. When we were evolving it would be even more limited. Now imagine explaining to a child the skill of hunting a bison without any props – so art is the props. This assumption, that our imaginative capacity was even more limited, isn't crucial. Even if it's as limited as it is now it can still be helped by art as a form of virtual reality, to try out different scenarios – just as a child likes to play with action figures. You can just do it in your head, but the point is that with the action figures it tremendously enhances the ability to enact scenarios.

The playful rehearsal involves circuits of the brain which are involved in discovering, locating and identifying objects – first and foremost – and also creating virtual reality simulations to enable you to rehearse things before you actually do them. It's very simple-minded, but that's what I think made them take off.

Now you could also say that the arts are transcendental, that they contain unexplainable, mystical, divine elements. All that is true, but science is the art of the soluble.

Guy Claxton talked about the ineffable feeling of meaning that was never quite realised.
There's no big mystery there. It's not fun if it's realised. It's like climax without foreplay. In visual art you need visual

RAMACHANDRAN'S UNIVERSAL LAWS OF ART

1. Peak shift
2. Grouping
3. Contrast
4. Isolation
5. Perception problem solving
6. Symmetry
7. Abhorrence of coincidence/generic viewpoint
8. Repetition, rhythm and orderliness
9. Balance
10. Metaphor

foreplay before the climactic 'Aha' and all the little 'Ahas'. And that makes the climax all the more enjoyable, if you'll pardon the reference to sexuality. The reason is, of course, that in evolution that makes sense. If you're trying to find something in the fog, it has to be tantalising. You have to enjoy the chase so that you don't give up before it's over. Now that's not only true metaphorically, it's true literally.

I was thinking more about the 'feeling of meaning' and the temporal lobe epileptics you mention in *Phantoms in the Brain*, who along with their seizures get a religious feeling of certainty and enlightenment.

That harks back to what I said was one of the most enigmatic parts of art – the transcendental. You look at a lot of Indian art, it is all beautiful. It is all sensual art, but there is also another aspect of it. There is harmony. The beauty of true art is the perfect balance between the real and the ideal, between the human and the divine. So there is a striving. You know you are an angel trapped inside the body of a beast, with a sense of striving, a craving for transcendence that some art brings out. If you ask me to explain it biologically – why is this useful – that's hard. We haven't got there yet!

But isn't the biological grounding of that – by saying it's stimulation of the temporal lobe – diminishing to the value of the experience?

No. It only takes care of two of three questions we need to ask as scientists. It takes care of what it is, of what produces it. It takes care of the biological anchor. But it doesn't say why the function is: why does it help the organism?

With grouping I can tell you why it exists – it is to discover an object. With peak shift I can tell you why. But with transcendence, I can't tell you why. All I say is that it feels good. So it could be epiphenomenal, but that's hard to believe because it's so compelling and so important to the brain, to the aesthetic experience. There's something going on that we don't really understand.

Listening to your ten principles of aesthetics they all sound plausible, and I'd like to believe they're true – but a cynic would ask how can we demonstrate they're true? It sounds unfalsifiable.

That's not true. It is falsifiable, in principle, by a couple of experiments. Here's one. I've predicted in one of my essays that Picasso – cubism – overexcites cells involved in face processing. If you look at the hierarchy of visual areas you first find cells that respond to faces – but only one view. So one responds to this view, one to this view, one to this view. That's useless. If you want to recognise your mother you need to recognise her no matter where she's looking, not just that particular view. Now the next stage in the processing hierarchy you get a cell that responds to a person, but any view of that person! Now how do you construct a cell like that? Nobody knows. But one possibility is to take all of the outputs of the individual-view cells and make them funnel all their information into what I call this master face cell. But now think of what happens if you take two views of a face and juxtapose them. What's going to happen? You're going to excite two individual-view cells simultaneously. And you're going to get twice the excitation of the master cell – a real jolt.

This is a highly reductionist way to explain why a Picasso is evocative. So how do we test it? We (a) record from cells in the brain, and (b) test galvanic skin response. I'm predicting that if I show you your mother's face you'll get a huge galvanic skin response, if I show you some stranger's face you won't. If I show you a cubist view of your mother's face it should be even bigger, if I'm correct.

So these are testable propositions. Now you could say, 'Maybe you'll turn out to be wrong, what'll you do?' That's the beauty of it. In most of philosophy you can't prove something wrong. What I'm offering you is a number of testable conjectures and one pathway to ignorance is closed when you've got it wrong, as Darwin said. And that can sometimes automatically open up another pathway to knowledge.

Already people are starting to talk about the ten laws of art, about which laws might be true and might there be other laws, about how do you test them and how might they function. So you get this dialogue. The need for these three elements: the statement for the function or logic of the law; the statement about its biological rationale – why it has its form; and thirdly, its neural circuitry. Getting people to think about all this is getting us closer than ever before to understanding the laws of aesthetics.

These are meant to be heuristics. I'm not saying; 'I understand the laws of art, problem solved, lets go on to something else.' I wish! We're just barely scratching the surface. I think the statement of these laws has made more progress than the preceding 3000 years of waffling about aesthetics and principles of art, but it's not for me to say that.

FURTHER INFORMATION

Reading

Ramachandran, V.S. (2003). *The emerging mind: The BBC Reith Lectures*. London: Profile Books.

Ramachandran, V.S. (2004). *The artful brain*. London: Fourth Estate.

Ramachandran, V.S. & Blakeslee, S. (1999). *Phantoms in the brain: Human nature and the architecture of the mind*. London: Fourth Estate.

Weblinks

Ramachandran's homepage:
psy.ucsd.edu/chip/ramabio.html

The Reith Lectures:
www.bbc.co.uk/radio4/reith2003/

The Winchester Festival of Art and the Mind:
www.artmindfestival.com/