YOUR ESSENTIAL GUIDE TO THE YEAR AHEAD FROM WIRED MAGAZINE SPECIAL EDITION

II RIE D WEDITION WEDITION ORLD ORLD

RICHARD BRANSON

ON SAVING THE OCEANS

JAMES DYSON

ON LEAN ENGINEERING FOR SUCCESS

RORY SUTHERLAND

ON THE NEW RULES OF ECONOMICS

ANNE-MARIE SLAUGHTER

ON GOVERNMENT AS PLATFORM

+70 OTHER EXPERTS

THE MUST-KNOW TRENDS

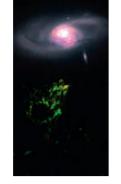
IN TECHNOLOGY/MEDIA/POLITICS

SCIENCE / BUSINESS HEALTH / LIFESTYLE AND ARCHITECTURE

2012 / 2013 £4.99 WIRED.CO.UK THE FUTURE AS IT HAPPENS ► 132 PAGES OF IDEAS TO FUTURE-PROOF YOURSELF AND YOUR BUSINESS "wire" and synapse. At this resolution, a cubic millimetre would yield a petabyte of image data, the equivalent of a billion photos from a digital album. MRI brain scans, by contrast, blur a cubic millimetre into a single pixel.

To handle the deluge of data, my laboratory has created EveWire, a website that recruits volunteers to explore the retina, the neural tissue of the eye. Think of the site as a gigantic 3D colouring book, the pages of which are images of the retina. By playing a game of colouring neurons, amateur neuroanatomists trace the wires of the retina, working together to find a neuronal "wiring diagram". Such a map, also known as a connectome, will help us understand how the retina serves visual perception.

Anvone can sign up to play; the only qualifications are curiosity and a zest for careful observation. By 2013, we should be ready to scale up from thousands



Hanny's Voorwerp is the green cloud, below spiral galaxy IC 2497

to millions of players. This is a new age of exploration. By recruiting enough amateur and professional scientists, we will be able to make significant breakthroughs in our understanding of the human brain.

Neuroscientists have long hypothesised that our memories are encoded in our connectomes, because each experience leaves a trace on the brain by altering neural connections. We will test this hypothesis by attempting to read memories from connectomes. And that is just the start. We will be able to tackle other scientific mysteries - such as perception, consciousness and psychiatric disorders - by uniting our minds to explore the brain. Sebastian Seung is professor of computational neuroscience at MIT and the author of Connectome: How the Brain's Wiring Makes Us Who We Are (Allen Lane) (evewire.org)

RELIGION GOES INTO THE SCIENCE LAB

THE MYSTERIES OF FAITH WILL SOON BE UNLOCKED. THANKS TO A BLEND OF PSYCHOLOGY, HISTORY AND NEUROSCIENCE. BY OMAR SULTAN HAQUE AND DAVID RAND

he supernatural is often seen as fundamentally beyond the reach of scientific study. But an emerging movement suggests that its social, psychological and biological manifestations are not, and it is profoundly changing our understanding of religion and religious belief.

Traditionally, lone scholars studied religion by reading and interpreting texts and historical archives, or by observing and trying empathically to describe a culture. But interdisciplinary cognitive science can complement these methods. This approach is exploring how religion works. Scholars are dispensing with boundaries, combining psychology, neuroscience and history to study religious beliefs and experiences.

For example, what makes some people, but not others, believe in God? One of us, David Rand, is involved in a study at Harvard that found that people who go with their gut tend to be more religious, whereas more reflective people tend to be more atheistic. Furthermore, just recalling a situation where one's first instinct was correct led to a dramatic increase in reported belief in God. Another study, published in Science, found similar effects with even subtler cues. So, although theologies may be the result of explicit extrapolation over time, it seems that most everyday belief comes from default intuition. For example, the tendency to see agency behind events facilitates social interactions. But, as Deborah Kelemen and Susan Carey at, respectively, Boston and Harvard's psychology departments have shown, this tendency is often extended to see the hand of God behind natural events.

Another area explores how people represent supernatural concepts in their minds. Central to most religions is the idea of a God that is all-knowing, all-powerful and all-present. However, a study by a team at Cornell University, New York, found that religious people often think of God as being like a normal person, with limited attention (for example, having to finish answering one prayer before attending to the next) or limited perception (thinking a loud sound made God unable to hear another). This difference between implicit and explicit understandings of God is not unique to Americans: the same result was found in a study of Hindu concepts in India by Justin Barrett at Calvin College, Michigan. Our understanding of God is shaped by our own intuitions and it is hard for us not to anthropomorphise the supernatural.

As research such as this grows, what will the future hold? Traditional humanistic scholarship will always play a central role in our understanding of religion. However, it is clear that

> the humanities and sciences will continue to cross-pollinate. With the rise in experimental methods, we are poised to understand the role of religion in our past and present in a much more systematic and reliable way.

> Omar Sultan Haque is an instructor and postdoctoral fellow at Harvard University; David Rand is a researcher in behavioural economics at the Department of Psychology, Harvard University

BOOSTED FUEL CELLS

Hydrogen fuel cells could be five times more powerful - if research by scientists at the Institute of Bioengineering and Nanotechnology in

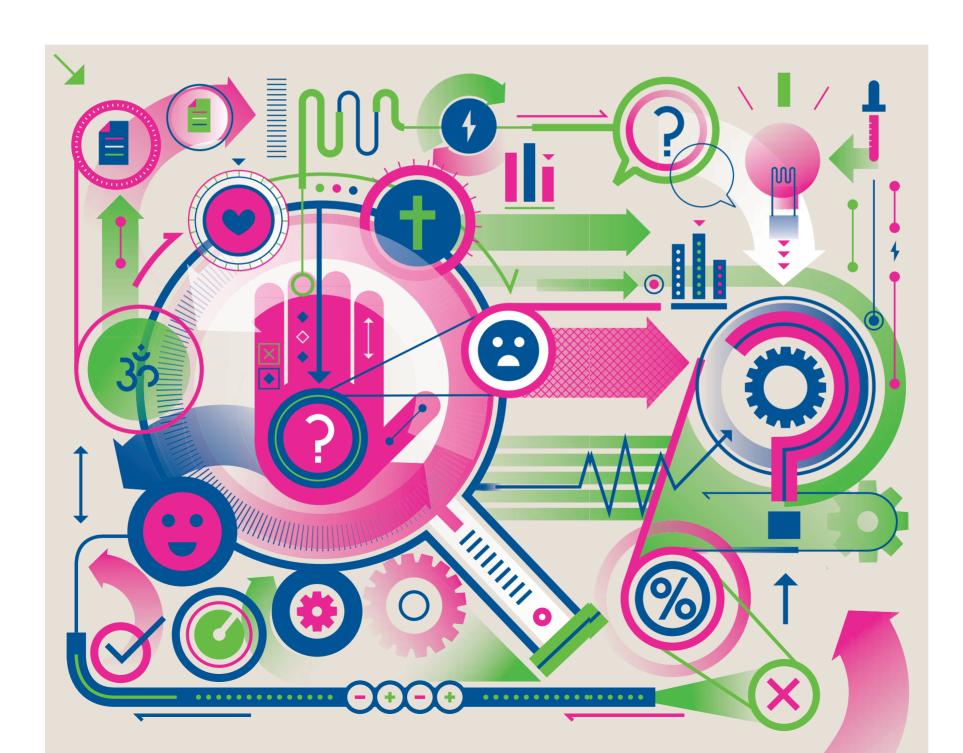
Singapore is put into production. Platinum is used to accelerate the reaction between hydrogen and oxygen that generates power, but combining it with gold and copper significantly increases its catalytic effect. It also boosts cell stability



SEAWATER URANIUM

Harvesting some of the 4.5 billion tonnes of uranium dissolved in the oceans will soon become viable. A team at the US Department of Energy's Oak Ridge National Laboratory has developed a material made from polyethylene fibres and compounds that have a high affinity with uranium, which captures seven times more of the metal than conventional processes in a seventh of the time.





A sponge developed by a team at University of Strathclyde, it collects blood spilled in surgery.

RECYCLE

Patients will be needing

fewer transfusions

thanks to HemoSep.

YOUR

BLOOD