

gene activity. He presents the cell as a theatrical production, noting that the standard view — with genes as directors, proteins as actors and other biochemicals as stagehands — needs to be reassessed. As an alternative to the ‘executive gene’ idea, in which the genome is in control, he urges readers to think about the ‘executive cell’. Francis relegates genes to members of the cast, and insists that they are regulated by, not regulators of, cellular states.

A seasoned science writer, Francis is at his best when describing abstract concepts in a historical context. A chapter on developmental biology reminds us that the idea that form emerges gradually during development (known as epigenesis) arose in

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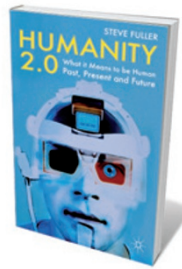
response to an earlier concept, which held that form is predetermined from the beginning (preformationism). Francis cautions us not to fall into the trap of using the ‘genetic blueprint’ or ‘genetic program’ metaphors, which he sees as contemporary preformationism or genomic determinism. He ends with an interesting concept — the ‘Janus gene’ — which has both the outward causal aspect of gene function and an inward aspect that is responsive to external cues.

Carey’s book is full of illustrations and entertaining metaphors. She describes the nucleosome as DNA wrapped around “eight ping-pong balls ... like a long liquorice whip around marshmallows”, and sees DNA as a film script, with plenty of room for interpretation and retakes. Carey’s experience of the biotechnology industry shows in her concluding remarks on the pros and cons of our growing understanding of epigenetics for drug discovery, and on understanding the impact of diet and environment on disease.

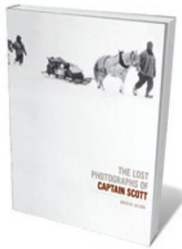
These two bold attempts to bring epigenetics to a wide audience are at the vanguard: more books will follow as the field matures. But future authors should avoid using the words ‘mystery’ and ‘revolution’ in their titles. What makes the field so exciting is that we have new tools to address old questions. Unravelling life’s mysteries? That’s not revolution, it is why we become scientists in the first place. My twin brother and I are both professors studying genetics — I still wonder whether that choice was determined by genetics or the environment. ■

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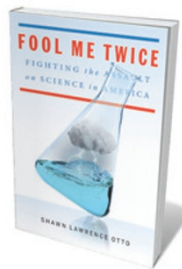
Books in brief



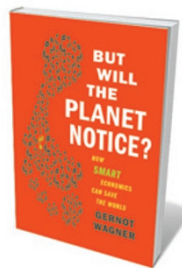
Humanity 2.0: What it Means to be Human Past, Present and Future
Steve Fuller PALGRAVE MACMILLAN 288 pp. £19.99 (2011)
Forget *Frankenstein* and *Metropolis*, says sociologist Steve Fuller. Neuroscience and technology are on a collision course that will catapult us to ‘transhumanity’, a future in which the state of being human starts to look decidedly alien. Fuller works his way through science, policy, history and philosophy, covering human biological roots and our aspirations to transcend them; the possibility of enhanced evolution as technologies converge; a ‘new theology’ inspired by figures such as Jesuit palaeontologist–philosopher Pierre Teilhard de Chardin; and our necessary quest for moral horizons.



The Lost Photographs of Captain Scott
David M. Wilson LITTLE, BROWN 192 pp. \$35 (2011)
‘Lost’ is a refrain commonly associated with Antarctic explorer Robert Falcon Scott — lost race, lost hopes, lost lives. Now, a stunning record of his last months has been found, giving a glimpse of fieldwork at the ‘final frontier’. In keeping with the research aims of the expedition, Scott shot 120 photographs between Cape Evans and Beardmore Glacier before his team’s final, ill-fated push. Most of the images — icy panoramas, portraits, snaps taken on the move — are published here for the first time, with text by polar historian David M. Wilson, great-nephew of Scott’s science chief Edward Wilson.



Fool Me Twice: Fighting the Assault on Science in America
Shawn Lawrence Otto RODALE 384 pp. \$25.99 (2011)
Less than 2% of US senators and representatives have a scientific background, but more than 40% are lawyers. Shawn Lawrence Otto suggests that is why US policy-making is rich in rhetoric and poor in reasoning. Reminding us of the crucial separation of church and state at the birth of the United States, Otto traces shifts in national attitudes to science and technology — from early wonder through atomic-era fear to widespread rejection. That these shifts are happening precisely when big science is needed to tackle global challenges should, he says, push researchers to re-engage with politicians.



But Will the Planet Notice? How Smart Economics Can Save the World
Gernot Wagner HILL AND WANG 272 pp. \$27 (2011)
The plastic-bag militants have got it wrong, says economist Gernot Wagner. We can save the planet by cutting out scientists, politicians and environmentalists in favour of economists. It’s they, he claims, who have revealed our mixed-up thinking, as we buy locally grown apples chilled for months, or clear rainforests to grow soya. Wagner calls for smart economics, such as capping pollution and paying for free resources. Billions of us must be motivated for change to be meaningful — and the best incentive is market forces, he says.



On Extinction: How We Became Estranged from Nature
Melanie Challenger GRANTA 272 pp. £20 (2011)
Writer and poet Melanie Challenger explores extinction, both biological and cultural. Roving through wild landscapes — Antarctica and the Arctic, disused Cornish tin mines and old whaling stations in South Georgia — she interweaves the science on ecological loss and climate change with histories of failed industries, extinguished languages and wars. From albatrosses on Bird Island, South Georgia, to the Inuit of Canada’s Frobisher Bay, Challenger combines her meditations on our fragmenting world into a finely integrated study of loss.