► Organization to work out principles for governing land acquisitions in developing countries. This has emerged as one of the most controversial aspects of African agriculture, with most of the land deals concentrated in countries such as Ethiopia, Ghana, Liberia, Madagascar, Mozambique, South Sudan and Zambia.

These are relatively poor countries that need enhanced capability in resource management. Simply offering new guidelines won't do it. Ethiopia, for example, has a long-term vision to modernize its agriculture, but Brown offers little indication of how such countries could play a part.

There have been previous predictions of food crises. A variety of creative responses — especially those made possible by advances in science and technology — helped to forestall disaster and buy the international community time. The green revolution, by introducing inputs such as fertilizer and high-yielding crop varieties, boosted food production. Brown ignores technology, however, even though almost all of the measures he proposes — from the management of population to the expansion of prosperity and switching of energy sources — require the marshalling of human ingenuity.

The green revolution offers another important insight: Latin America and Asia responded to the food crises by expanding local food-production capacity. A global network of agricultural research institutes was created under the Consultative Group on International Agricultural Research (CGIAR) to promote such capacity. The CGIAR is probably the most important geopolitical innovation ever created in response to food crises. The world will need to either strengthen it or offer an alternative.

Full Planet, Empty Plates is a call to arms against the wolf at the door. Admitting the presence of a wolf is one thing; designing an attack strategy is another. For that, we need to turn elsewhere. ■

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BIOTECHNOLOGY

Random harvest

Ian Wilmut assesses a critique of how genomics, bioethics and neuroscience are meeting their potential.

The subtitle of this book — *Bioscience's Promethean Promises* — led me to expect I would be reading about the harm caused by biomedical research. Instead, I found a scathing account of the failure of recent projects in biology to provide significant new knowledge.

In *Genes, Cells and Brains*, their fifth book together, sociologist Hilary Rose and her husband, neuroscientist Steven Rose, consider in detail several disciplines that have become fashionable during the past 30 years. These include genomics, experiments on animals, biobanks, regenerative medicine and neuroscience. The duo also reviews mechanisms of evolution and informatics.

The authors introduce each theme with a historical account of its scientific, ethical and sociological background, according to their views. Anyone who has read *Love, Power and Knowledge: Towards a Feminist Transformation of the Sciences* (Polity, 1994) by Hilary Rose and *Alas Poor Darwin: Arguments Against Evolutionary Psychology* (Jonathan Cape, 2000), edited by both authors, will know broadly what to expect from their socialist and feminist perspectives. So there is criticism of modern academics being encouraged to patent their research or becoming involved in commercializing their work, and of pre-implantation genetic diagnosis. Whether or not you agree with the Roses' perspectives, they provide thought-provoking and interesting contrasts to the secular, neo-liberal view that predominates at present.

The authors describe why, in many cases, they believe that misunderstandings about the underlying biology inevitably led to projects failing to achieve their aims. In their view, for example, the gene-centric view of biology exaggerates the probability of finding linkages between genes and

disease. They also forcefully criticize today's free-market capitalist global economy, suggesting that the undesirable social environment it creates often leads to inappropriate organization of bioscience projects, with, for example, serious risks of personal data being released into the public domain.

They address their criticisms particularly

Genes, Cells and Brains: Bioscience's Promethean Promises

HILARY ROSE AND
STEVEN ROSE
Verso: 2012. 336 pp.
£20, \$26.95

at the genome-wide association studies of human inherited disease that have sprung up since the human genome was first sequenced. In such studies, the genomes of populations in a community are analysed in a search for evidence that a specific form of a gene (allele) is associated with a high risk of the person having a serious illness. So far, these projects have failed to fulfil the unrealistic expectations that were raised by publicity from the research community.

But Will the Planet Notice? How Smart Economics Can Save the World

Gernot Wagner (Hill and Wang, 2012; \$16)

You can avoid meat, plastic bags and air miles, writes economist Gernot Wagner, but individual choices have no effect on the planet. Harnessing market forces to incentivize green behaviour is the key to confronting climate chaos, he argues.

Alone Together: Why We Expect More from Technology and Less from Each Other

Sherry Turkle (Basic Books, 2012; \$16.99)

Computers are changing the way we interact, warns social scientist Sherry Turkle, leading us to view digital connections as a substitute for intimacy. Many people are 'always online'; others have never known life without computers.

I must declare an interest: I am a member of the group that the Roses hold largely responsible for the failure of the “New Biology” to provide important new knowledge. I am a 68-year-old Caucasian male who has worked in biotechnology for the past 30 years; I am also one of the inventors named on several patents. At one point I was an employee and shareholder of Geron in Menlo Park, California, a biopharmaceutical company that is criticized in one section of the book.

The authors repeatedly raise two general concerns about biotechnology. They criticize the extent to which many biologists, adopting a gene-centric view, attribute aspects of human behaviour — including sexuality, an inclination to shoplift and altruism — to the influence of specific genes. They make the point that humans and fruitflies have a very similar number of genes, but very different levels of complexity, with the implication that genes cannot account for everything.

In this context, it is surprising to see so little mention of the apparent role of the different populations of RNA molecules in generating complex functions. Reports of the ENCODE project, which is providing the first detailed map of these regulators, were published in September. However,

the general concept that non-coding RNA sequences have a vital regulatory function is more than a decade old (J. S. Mattick *EMBO Rep.* 2, 986–991; 2001).

The authors’ second beef is that commercialization now so dominates science that it distorts research management and priorities. They assert, for example, that successive British governments have supported research with human embryonic stem cells because of the potential for wealth creation. To those of us involved in the research, these unique cells should be thoroughly investigated because of the potential to treat debilitating degenerative diseases for which there is currently no treatment.

Without wishing to ignore their charge, I would balance the discussion by mentioning the private sector’s very large investment in biotechnology. The authors surely do not imagine that governments would provide such funding if private investment ceased?

What of their overall comments about genomics? No doubt many of those who were involved in the research are as disappointed as the authors by the limited clinical benefit so far. Experience shows that it is difficult to predict the outcome of research and that it is hard to estimate the use that can be made of new knowledge. However, thousands of academic and clinical laboratories are making daily use of information about the human genome and of the methods that have been developed during the past decade for measuring gene expression in a small sample of cells.

I share the authors’ disappointment at the rate of progress. But I am convinced that, in time, these fields will provide treatments for diseases such as motor neuron disease, multiple sclerosis, Parkinson’s disease, diabetes and some forms of heart disease — eventually having a beneficial effect comparable to the revolutionary control of infectious diseases achieved during the past century. Sadly for those currently afflicted, it seems that it will take several decades for this to happen. ■

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The Magic of Reality

Richard Dawkins and Dave McKean (Doubleday, 2012; £19.99)

In this edition of his illustrated bestseller for young people, eminent biologist Richard Dawkins aims to reveal scientific truth as more magical than myth, while Dave McKean’s photoreal images viscerally evoke the wonder.

The Fair Society

Peter Corning (Univ. Chicago Press, 2012; \$17)

A sense of fairness is innate in humans, argues Peter Corning. He cites examples such as public outcry at discrimination cases and divorce-court wrangling as evidence that society is underpinned by notions of reciprocity, justice and what is fair.