

# Designer genes and legal briefs

## Remaking Eden: Cloning and Beyond in a Brave New World

by Lee M. Silver

Avon/Weidenfeld and Nicolson: 1998.

Pp. 315. \$25, £20

John Cairns

In the nineteenth century, most of what was going on in the sciences was accessible to the whole of the reading public. George Eliot, it is said, was engrossed in the proofs of Darwin's *Origin of Species* on the day it was published; and doctors in the United States had built their own X-ray machines for the treatment of breast cancer within a few months of reading about Röntgen's discovery of X-rays. During the past century, however, science has become so weighed down with facts that most of us can understand it only through the use of some kind of intermediary.

At the same time, science has become increasingly important. Political changes dominated the nineteenth century; science promises to dominate the twenty-first. Because democracy has proved to be, in the long run, the safest political system, it is very important that everyone, not just an intellectual élite, should have access to reliable guides to the science underlying what is happening to the human condition.

Nowhere is this more important than in the matter of genetic engineering, where opportunities for irreversible mischief seem almost limitless. So it is a great pleasure to report that Lee M. Silver's book about the genetic engineering of humans is very good indeed. He has first-hand knowledge of his subject and writes clearly and skilfully. His book covers the ways in which we are now able, or may soon be able, to decide the genetic constitution of our children. The description is in the form of a series of little family histories, some real, some imaginary. Each serves to introduce some particular technology and is accompanied by an account of the relevant sector of molecular biology or developmental genetics.

Some of the problems have already come to light. For example, what should be done with frozen embryos if both parents are killed in an accident? Is it right for a woman to decide to have a second child so that it can provide the marrow transplant that may save the life of a first child who is dying of leukaemia?

Other problems are just around the corner. Should a woman be allowed to bear a daughter who is a clone of herself (and, I might add, if the woman later dies, should her widower be allowed to marry the clone on the grounds that he is, in effect, remarrying his wife)?

Some of the case histories discussed by



Nice body work: products of engineering as foreseen in the film *Brave New World*.

Silver promise to be as divisive as the issue of abortion. He seems particularly worried that genetic manipulation may eventually be able to offer general benefits, such as increased intelligence and resistance to disease. Because of the expense, these benefits will be available only to the rich, and he fears that, after many generations of manipulation, the human population may find itself divided into two distinct species (he calls them 'GeneRich' and 'Naturals') that cannot interbreed. Of course, the separation into rich and poor has been with us since the beginning of civilization, but has been partly relieved by a steady flow between the two groups owing to the fluctuation in people's fortunes. A division based on artificially enhanced intelligence might be far more destructive. (I understood that the British Labour Party, when it came to power after the Second World War, decided to leave untouched the so-called public schools because it felt that an oligarchy based on wealth was bound to be less entrenched than one created by extra education for the cleverest children.)

The book deserves to be widely read, not least because it gives such a lucid account of the science. But I am less worried than Silver about the genetic engineering of humans. Far more important, I think, is the danger if we come to rely exclusively on highly engineered crops, and the danger posed by new microorganisms that terrorists can now design using equipment as compact as the apparatus of the nineteenth-century physicist that could have been brought in by his butler, on a tray. Surely, if there is a forbidden apple in the new Eden, it is most likely to be

found in the genetics of plants or microbes.

I hope that Silver will now look at these other fruits of genetic engineering. In some ways they are harder subjects because they do not concern simply the morality and legality of what can be done. But they are a more likely way for mankind to get into trouble than just by meddling with the genes of some of the richer members of the richer nations. □

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## Spin doctors

### Paul Dirac: The Man and his Work

edited by Peter Goddard

Cambridge University Press: 1998. Pp. 124.

£12.95, \$19.95

### The Story of Spin

by Sin-itiro Tomonaga, translated by

Takeshi Oka

University of Chicago Press: 1997. Pp. 258.

\$50, £39.95

Ian Aitchison

On the left, leaning elegantly backwards at an angle of 30 degrees to the vertical (but supported by solid stonework), head attentively inclined, is the slighter and older figure; on the right, vertically framing the space left by his listener's tilt, hands persuasively moulding the shape of the argument, is the handsome younger one. The old master and the young; the old world and the new; it is (as the caption says) "Dirac and Feynman discussing Physics".

The photograph, one of my favourite