

brought about the hijacking of a major portion of the energy and resources of the Convention. The impetus has thus been directed away from real and present threats to biodiversity toward an area (biotechnology) that is not a significant threat; furthermore, one that promises to enable major strides toward improved agricultural sustainability in both the industrial and developing worlds. A sadder litany of missed opportunities and misdirected efforts would be hard to find.

As valuable and instructive as this book is, it only sets the stage for a more thorough exegesis of the negotiation process, a more profound diagnosis of what went well, and what went wrong. This is particularly evident in its treatment of the biotechnology/biosafety issues. Although mostly accurate (but not completely so), it never conveys much understanding of the reasons that led different countries to adopt different positions. And while anyone who knew the author during the negotiations would be astonished to find that she possessed less than a complete understanding of these issues, the book demonstrates more than once that she misunderstood US positions. (To be fair, she was far from alone.) Because these were pivotal at several points in the negotiations, and led to an unusual degree of diplomatic difficulty and international ill-will, such understanding (and its absence) is of more than parochial significance.

The decision of the Conference of the Parties in Jakarta last November to introduce a protocol on biosafety under the Biodiversity Convention—the target date for which is 1998—is now irrecoverable. This may well be, as many think, illogical; but that is now irrelevant. The task for interested parties is to ensure that the process produces the best protocol possible; that is, one that answers the undeniable desire of many countries for increased international cooperation in dealing with new biotechnology products, but inflicting the least damage on biodiversity, agriculture, or international commerce. Without more sustained and strategic involvement from the biotechnology industry than we have seen to date, this will not happen. No better demonstration of why such involvement is needed can be found than that provided in this book.

## Genethics and eugenics

*The Ethics of Human Gene Therapy* by Leroy Walter and Julie Gage Palmer. Oxford University Press, Oxford, 1996, pp. 195, (hbk).

Robert Pollack

The human gene pool looks calm on the surface, but there are rocks and hard places beneath, and its bottom is littered with false hopes and impossible experiments. Walter and Palmer have written a careful and thoughtful book on current and possible future uses of DNA sequences to repair, modify, replace or delete sequences in the human genome. The book sails smoothly along through the fundamentals of genetics and the mechanics of DNA transfer, and then hits the new hazard of germ-line gene-engineering, and—while letting down the old eugenic lifeboat—sinks.

All of the genetic inheritance we can give to one of our descendants must first be packaged in a single egg or sperm cell; germ cells do the packaging. Somatic cells create and become the parts of the body that do not form either sperm or egg, and they do not contribute their DNA to future generations. Manipulation of the genes of somatic cells may have untoward side effects—mutation or deletion of random, functional alleles, elsewhere in the genome—but there are no major medical/ethical barriers to somatic cell gene therapy to repair damage arising from the inheritance of a rare allele or two.

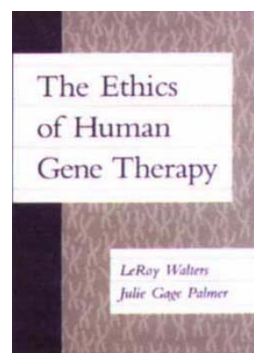
The opposite is true for manipulation of a person's germ cells. This work cannot be called medicine at all; it will at best have no clinical consequences for a person already born with an inherited condition. All it can possibly do is change the genetic constitution

of a future child born from one of the person's sperm or egg cells or, to use the jargon of the enthusiast, improve the human gene pool. The very calmness of the authors in describing some future germ-line scenarios makes these all the more chilling, especially the ones that involve conditions, rather than diseases: "genes for" sleeping less (and so working more), "genes for" greater height, and of course "genes for" smartness, all available to those who can pay. The authors do have their limits: To be ethical, all of these future germ-line therapies would have to be "strictly voluntary," never coercive.

But do such "genes for" interesting parts of the body or mind exist in the first place? This choice of words fails to distinguish the change in phenotype brought on by a single allelic difference from the vastly multigenic chain

that is the genetic component of any socially or politically interesting human phenotype. There are probably tens of thousands of genes that go into the making of a functional brain, and probably a null allele in many or most of them will damage musical ability. When that gene or any other is present in a functional allele, it is just a link, never the whole chain. Most, if not all, of the "genes for" musicality or any other pleiotropic phenotype will also effect the development and function of the entire body in wholly unpredictable and interlocking ways.

This is a serious book, a good summary of many ethical issues in current somatic gene therapy, with the authors' own opinions clearly marked out. But reader beware, it is also a scary example of the repressed eugenic dream's return. Germ-line treatment to cure us of the diversity of the human condition is so far off in practice that scientific as well as ethical considerations suggest that plans for human germ-line gene therapy of any sort be indefinitely put off.



### Books received

- *Microbial Food Poisoning*, 2nd Edition. Adrian R. Eley (ed.). Chapman & Hall, 1996, pp. 211, (hbk).
- *Methods in Molecular Medicine: Molecular Diagnosis of Cancer*. Finbarr E. Cotter (ed.). Humana Press, 1996, pp. 218, (hbk).
- *The Thread of Life: The Story of Genes and Genetic Engineering* by Susan Alderidge. Cambridge Uni. Press, 1996, pp.255, (hbk).
- *And the Blood Cried Out* by Harlan Levy. Basic Books, 1996, pp. 223, (hbk).
- *Bone Morphogenetic Proteins: Biology, Biochemistry and Reconstructive Surgery* by T. Sam Lincoln. Academic Press, 1996, pp. 312, (hbk).
- *The Microbe Hunters—Then and Now*. Hilary Koprowski and Michael Oldstone (eds.). Medi-Ed Press, 1996, pp. 454, (hbk).
- *Combinatorial Libraries: Synthesis, Screening, and Application Potential*. Cortese R (ed.). Walter de Gruyter. 1996, pp. 232, (hbk).
- *Agricultural Biotechnology and the Environment: Science, Policy and Social Issues* by Sheldon Krinsky and Roger Wrubel. University of Illinois Press, 1996, pp 294, (pbk).