garding amniocentesis. Their approach is well known from other contexts, including a previous volume of the Birth Defects: Original Article Series (15[5C], 1979). In discussing the assets and limitations of their approach, they suggest that it allows partners to share their respective values openly, sometimes for the first time; that it tends to suppress such irrelevancies as the neighbor's experiences and opinions; and, at worst, that it may add 10 more minutes to the counseling session; for some, anxiety and distress may occur when differences between partners emerge. They reported that some subjects found the decision-analysis procedure fatiguing; this suggests that not all subjects had a clear picture beforehand of the mental/emotional demands that would be made of them. The extent to which actual decisions matched those consistent with the model was not dealt with by the Paukers.

This book raises some troubling questions about the aims and methods of genetic counseling and genetic counselors. The risk-analysis approaches advanced by some of the participants requires consumers to participate in a formal protocol irrespective of their particular needs, personality structures, and psychosocial situations and as if their decision-making capacities were impaired. Furthermore, they are required to understand the professional and his or her language or jargon and way of thinking and analyzing problems. This is a total reversal of the usual counseling stance, in which it is the professional's task to understand the phenomenological world of individual consumers and, through skill, caring, and empathy, help the latter arrive, in their own ways, at decisions consistent with their overall life dreams, values, and goals. Decision technology also assumes, among other things, that the decision maker is rational. But, as some of the conference participants pointed out, people bring more than their rational selves to bear in their problem-solving activities. Also, the dynamic side of human psychological life is not adequately accounted for when decision technology is applied. When all is said and done, one wonders whether decision aids are worth the effort they require in genetic counseling. Perhaps the counselor—working without gimmicks and flow charts but simply with caring words, patience, and empathy—might do as well, if not better, to provide help to other human beings who need to make difficult decisions.

Implicitly, this book deals with the questions of how to use decision technology to promote human benefit and how to apply this technology to human problems without losing sight of the richness of being human. Anyone interested in the complex issues of decision making in the face of genetic risks should read this book to gain a better understanding of the explicit and implicit problems with which the field of genetic counseling is struggling.

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Gene Transfer. Edited by Raju Kucherlapati. New York: Plenum, 1986. 447 pp. $59.50.

Gene transfer processes have greatly aided the genetic and biochemical characterization of a variety of biological systems. While many different natural recombination phenomena were available for early microbial manipulation, advances in culture technique, gene delivery, and recombinant DNA technology have only more recently allowed detailed mammalian analyses. This volume is an up-to-date and comprehensive treatment of the subject and goes in depth into mammalian parasexual gene transfer methodologies and applications, as pointed out by Ruddle in his opening chapter. It is an excellent book, which covers the range of sequence sizes, from whole cellular genomes down to cloned sequences, the transfer of which has proved so useful in addressing structural and functional questions in the genetics of mammalian cells. There has been an outstanding selection of eminent authors. Most chapters include a technical explanation, but the emphasis is on biological relevance.

Somatic cell hybrids (i.e., whole genome transfer) have been used extensively for the purpose of chromosomal assignment. The total cumulation of assignments is summarized by Shows in his comprehensive and updated review of the field (chapter 2). Microcell-mediated transfer (Lugo and Fournier, chapter 3) adds the advantage that fewer donor chromosomes are delivered and maintained in recipient cells, thereby simplifying analysis of hybrid panels. The transfer process is further refined by using metaphase chromosome transfer (Houseman and Nelson, chapter 4), an approach that has been facilitated by inserting dominant selectable markers into donor chromosomes prior to transfer.

Several different DNA virus systems have been developed for gene transfer and expression. Their utility varies, depending on host range, suitability for heterologous gene insertion into the vector, helper requirements, and resultant cellular location of transferred material. The attributes of each system, as well as a brief overview of virus characteristics relevant to gene transfer, are covered excellently by Baichwal and Sugden (chapter 5). Retroviral vectors provide the most efficient means of gene integration into mammalian cells. A variety of transmission and expression strategies in the use of retroviral vectors is clearly presented by Temin (chapter 6). The latter chapter is extremely well complemented by the chapter on retroviral integration (Goff, chapter 12), covering molecular aspects and consequences of the insertion process. Belmont and Caskey discuss the possible application of retroviral and other vectors in the treatment of human genetic disease (gene therapy, chapter 15).

Gene transfer procedures have been particularly useful for analyzing the role of specific sequences in regulating mammalian gene expression. Several different gene expression systems studied in cultured mammalian cells are dis-

cussed by Chao (chapter 8). Transfection and expression in mammalian cells can also be used for the purpose of isolating gene sequences (Pellicer, chapter 10) and for the study of gene amplification and coamplification of linked genes (Wahl et al., chapter 11). Introduction of new sequences into the mouse germ line by microinjection of embryos has been a fruitful approach in the study of development and the regulation of tissue-specific expression (Tilghman and Levine, chapter 7). The excellent review of this topic includes observations on virus infectability and viral gene expression in developmental systems.

Transfected DNA undergoes many specific and nonspecific reactions intracellularly. The tendency for nonspecific rearrangements to occur has been effectively assessed by using autonomously replicating shuttle plasmids that are easily rescued from mammalian cells and scored in bacteria for mutational events (Calos, chapter 9). Incoming DNA usually integrates randomly but is subject to homologous recombination either between transfected DNA molecules or between transfected DNA and host chromosome sequences (discussed by Kucherlapati, chapter 13). Vectors can also be engineered and integrated into mammalian cells for the purpose of assessing and characterizing intrachromosomal recombination events (Letsou and Liskay, chapter 14).

To maintain coherence throughout the volume, the editor has organized the chapters so that the material presented in each of them nicely complements that contained in other chapters. I find this book to be a useful introduction to mammalian gene transfer concepts for graduate students and other newcomers in this area, as well as a convenient reference source for specialists in the field.

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Cleft Lip and Palate: Aspects of Reproductive Biology. By Krishna R. Dronamraju. Springfield, IL: Charles C Thomas, 1986. 165 pp. $24.75.

Cleft Lip and Palate is an original attempt to illustrate the importance of prenatal selection as a determining factor in the prevalence of congenital malformations. The subject is introduced in the first chapter, where a description of the magnitude of prenatal selection against malformed embryos/fetuses in human and other species is given. Of particular value is the detailed account made of the original contribution of Dr. Nishimura to this field.

The second chapter outlines the epidemiology of various forms of oral clefts. This chapter contains a remarkable iconography of various forms of oral clefts.

The third chapter critically and convincingly examines the available evidence on the existence of prenatal selection against embryos/fetuses with oral clefts. It is the cornerstone of the book. Under direct scrutiny are the signs of operating prenatal selection (e.g., sex ratio at birth, time interval between successive pregnancies, etc.) in relation to the prevalence of various forms of oral clefts in three large studies, one of which is contributed by the author. Of particular significance is the implication of the existence of prenatal selection on the etiology of "sporadic" and familial oral clefts. The concept is very well summarized in a diagram on page 73. The chapter ends with a brief description of possible causes of death in embryos/fetuses with oral clefts.

The following chapter is a short review of the known genetic and environmental factors involved in the etiology of oral clefts. The author favors a multifactorial threshold model to interpret the available human data. A three-threshold model is proposed to take into account the previous data on fetal mortality. A brief chapter on syndromic oral clefts closes this section of the book. I found this section of the book rather weak. Considerable attention is given to the genetics of liability to cortisone-induced cleft palate but without addressing the difference that might exist between it and liability to cleft palate per se. Also, a detailed comparison of the several models proposed to explain the inheritance of oral clefts in humans would have brought considerable insight to the subject.

In the last section of the book, the author provides a succinct description of the concepts of genetic homeostasis and phenodeviants, and a systematic attempt is made to illustrate how the available human data may well fit these concepts. Although of great importance, I wish that these concepts had been introduced at the beginning of the book, to give the reader an underlying framework when walking through the book. A list of good suggestions for future research completes the work.

In my view, *Cleft Lip and Palate* is a challenging book. It is a book of concepts, and as such it should be required reading, particularly for human geneticists involved in developmental and prenatal genetics. Although the book is at times repetitive and the presentation of the tables and figures is somewhat in disarray, it is well written and contains an impressive iconography.

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Leaves of the Tulip Tree. By Juliette Huxley. Topsfield, MA: Salem House, 1987. 248 pp. $16.95.

The serpent was at the root of their problems. So it seemed, or perhaps it was their own fault for succumbing to temptation. In any case, Adam and Eve were expelled postprandially from the Garden of Eden. They were driven out of