

BOOK REVIEW

GENETICS AND MAN'S FUTURE: LEGAL, SOCIAL AND MORAL IMPLICATIONS OF GENETICS ENGINEERING

By M.A. Santos

Springfield, Illinois: C.C. Thomas, 1981. Pp. ix, 149, illustrations. \$18.75.

Reviewed by *Fred H. Bergmann**

In the preface to this short book, the author states that it was written for the concerned layman. Unfortunately, even those with some familiarity with genetics and the newer genetic technologies will be confused by this book. This is unfortunate. The rapid advances in the technologies associated with reproductive biology and genetics have profound implications for medicine and human reproductive decisions. All of us need to become acquainted with these changes so that we can make better informed decisions which will shape our future.

The book fails to distinguish among current technologies, technologies which are a few decades away, and "blue sky" technologies which are not likely to be developed in the near future. This failure detracts from a thorough consideration of our current technological dilemmas: the appropriate allocation of scarce medical or technological resources to competing needs in clinical genetics; the possible use or misuse of genetic screening tests in the work place; the continued polarization of society over who has the rights to make decisions about human reproduction; and the legal and social implications of our steadily increasing abilities to predict reproductive outcome.

The concerns of the next twenty years may stem from progress made in isolating genes from one individual, and our ability to transfer and integrate them into the tissues of another individual. This may well lead to new therapies for genetic disorders, such as sickle cell disease. Another emerging concern is the increasing proliferation of genetic data banks, which could provide access to a variety of information, at a time when individual privacy is felt to be threatened. The ultimate genetic record is, of course, a biological tissue such as blood. Such "records" can now be "read" with increasing sophistication, providing clues about topics as diverse as the tissue donor's ethnic background, predisposition to disease, and paternity.

"Blue sky" genetics, or "science fiction" genetics, is, by contrast, an extrapolation from theory or from what has been accomplished in the laboratory with lower animals to possible future human needs or

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wants. Many of these futuristic extrapolations from current knowledge focus on "cloning," that is, the process by which a group of genetically identical individuals are derived from a single individual. In one context, the products of "cloning" are familiar to all. Roses, potatoes, and many fruits have been developed by selections made decades ago which continue to be propagated asexually by tubers and grafted cuttings. In the sixties, J.B. Gurdon, a British scientist, transplanted a nucleus from a tadpole's intestine into an enucleated frog egg, and, in effect, xeroxed a younger replica of that tadpole. More recently, the nuclei of embryo mice were transferred to enucleated eggs. The eggs then completed their development in the uterus of a foster mother mouse. Notwithstanding another recent book,¹ which purported to be a nonfiction account of the cloning of a white Anglo-Saxon male, the cloning of human beings is, for a variety of legal, moral, and technical constraints, not a technology likely to be sought or achieved in the foreseeable future. *Genetics and Man's Future* makes almost no distinction between the immediate or readily foreseeable issues in human genetics and futuristic concerns such as the cloning of human beings.

The author provides the reader with a forty page introduction to human genetics in the book's first two chapters. However, let the reader beware! The introduction contains several statements which the author presents as fact, yet are in actuality his opinions. For example, the author states that,

Children have the moral, and in certain cases, the legal right to be born free from deformities. For prospective parents, accurate engineering (sic) information is a necessity if they are to make an informed decision whether to conceive a child. Prospective parents attempting to exercise their constitutionally protected right to determine whether to conceive a child usually cannot devote the time nor do they possess the wherewithal to search out relevant study materials. Thus, it is the duty of the government and especially of the physicians, then, to stay abreast of the modern developments in genetics and genetic engineering. (p. 6)

The introduction also contains misrepresentation of biological facts. For example, the author states that, "half of the offspring of females with Down's syndrome are similarly afflicted" (p. 16). Although it is true that Down's syndrome may be compatible with survival to a reproductive age, and that a few children have been born to female victims of that condition, the author does not tell us that such events are very rare. The selection of facts and concepts put before the unwary reader seems almost random; the significant and the insignificant seem to be given equal weight.

The introduction is followed by a chapter entitled "Genetic Engineering." This term is never defined. It seems to include eugenics, ge-

1. B.M. RORVICK, *IN HIS IMAGE: THE COMING OF MAN* (1978). This book created such a controversy when it was released in 1978 that the publisher eventually withdrew it from the market.

netic counseling, sperm banking, *in vitro* fertilization, cloning of individuals, and a description of various strategies to modify therapeutically the course of genetic diseases. Perhaps the term "Modes of Genetic Intervention" would have better described the topic, since genetic engineering has, in recent years, been associated with recombinant DNA technology and its implications for human health which are only peripherally described in the book.

The third chapter is entitled "Genetic Engineering and Society." It deals with voluntary and noncoercive decisions to limit procreation, and some of the newer reproductive technologies, such as artificial insemination and amniocentesis. This chapter also discusses the role of society and the government in procreative decision making and is a review of the history of sterilization programs in the United States.

The fourth chapter discusses "Evolution and Man's Future." Should *man* practice eugenics? Should *he* plan God by trying to manipulate *his* genes? The italics are mine to emphasize that the language used throughout the book does not seem particularly sensitive to the twentieth century notion that procreative decisions involve both sexes.

The book's glossary defines eugenics as "The science of improvement of the human race by better breeding" (p. 134). The author is properly cautious about a wholehearted endorsement of eugenics, particularly because the genetic basis of good traits, such as kindness, intelligence, or altruism, are still not understood. The author also explains that the practice of modern medicine may be dysgenic for the human species in that developments such as insulin therapy may contribute to the perpetuation of the genes which predispose to the disease; similarly, the use of eye glasses is perpetuating myopia. Although there is undoubtedly some truth in contentions such as these, it is to the author's credit that he does not pursue the point to the extent of seriously proposing social policies that seek to reduce the incidence of these conditions.

The book's closing sections contain what seems to be the author's primary motivation for writing the book. The author proposes that "at least those people who lack the total legal competency to act, and who fail to see the consequences of the burdens they cast upon society should be involuntarily sterilized" (p. 117). The author appears to support Mr. Justice Holmes' famous opinion that "the principle that sustains compulsory vaccination is broad enough to cover cutting the Fallopian tubes. . . . Three generations of imbeciles are enough."² The author also states that,

A recognition of social genetic duty should be encouraged. This duty, however, should not encourage the genetically afflicted to stop reproducing selectively. Rather, an attitude should be fostered to reproduce

2. Buck v. Bell, 274 U.S. 200, 207 (1927).

selectively. That is, by antenatal diagnosis the genetically afflicted can be informed which of their fetuses does carry known defective genes. Or else, some sort of genetic engineering can be performed (p. 120).

This reviewer agrees, at least in part, with the author.

The author concludes that we are not smart enough, yet, to try to influence the course of human evolution. The evolution of the human species still proceeds. It is an aggregate process influenced primarily by the individual reproductive decisions made by consenting adults. It is recognized that our social customs and mores, the practice of medicine, and the dysgenic effects of pollution and radiation will all have modifying effects on our evolution in ways that we do not appreciate or understand. However, conscious societal or governmental efforts to mold our gene pool seem most premature and ill-conceived. The dismal history of eugenics movements in Europe and the United States should contribute to a sense of caution about such ideas.

Can the book be recommended? No! It is a very poorly written and edited exposition of human genetics. Many of the very serious social, ethical, and legal issues that relate to the new and evolving genetic and reproductive technologies are either treated in a shallow and prejudicial manner, or are completely omitted.