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Great Plains Studies, Center for

February 1991

**Review of *Agricultural Bioethics: Implications of Agricultural
Biotechnology*, Steven M. Gendel, A. David Kline, D. Michael
Warren, and Faye Yates, Eds.**

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Ruttan, Vernon W., "Review of *Agricultural Bioethics: Implications of Agricultural Biotechnology*, Steven M. Gendel, A. David Kline, D. Michael Warren, and Faye Yates, Eds." (1991). *Great Plains Research: A Journal of Natural and Social Sciences*. 16.

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severely impacted by the loss of rail service.

Interstate trucking was initially placed under federal economic regulation in 1935. Major deregulation occurred with passage of the Motor Carrier Act of 1980. The authors cite several studies indicating relatively little negative affect on truck service following deregulation. Cost impacts were either neutral or positive. Competition from private trucking and from potential new entries in for-hire trucking tend to contain cost and maintain quality of service in trucking.

Bus service is frequently the only affordable and manageable intercity transport service available to elderly or otherwise physically-restricted persons in small communities. However, following persistent declines in ridership, only 42% of small towns had access to intercity bus service in 1978. The Bus Regulatory Reform Act of 1982 has resulted in relaxed entry into intercity bus markets and public/private experimentation to provide service. However, the authors report little or no benefit to small communities even six years after the act.

Trends in small community air service is explored thoroughly in this book. Air service was deregulated in 1978. Availability of air service is a valued characteristic for communities attempting to expand and grow. Since initial regulation of air service a prime objective of federal agencies has been to promote and expand the service. Public policies still promote essential air service wherever possible.

In the final chapter the authors bring together the variety of transportation needs of local communities, the service capabilities of various modes of transportation, and potential resources of public agencies to recommend strategies for adequate transport service to smaller communities. The insights of the authors are well worth serious study for public officials and private citizens interested in community development and in prospects for transport service to accommodate those communities. L. Orlo Sorenson, *Department of Economics, Kansas State University.*

Agricultural Bioethics: Implications of Agricultural Biotechnology. Steven M. Gendel, A. David Kline, D. Michael Warren, and Faye Yates, Eds. Ames, IA: Iowa State University Press, 1990. xxiv + 357 pp. Tables, index, endnotes, and illustrations. \$32.95 cloth (ISBN 0-8138-0129-X).

This book is largely the product of a series of faculty discussions and a symposium held at Iowa State University in 1987. It represents a comprehensive treatment of the safety and regulatory issues, economic prospects, social considerations, and ethical dilemmas emerging from

advances in molecular biology and agricultural biotechnology. Major attention is focused on bovine growth hormone (bGH). The book is the most useful introduction to these issues available under one cover. It is also a book of highly uneven quality. The papers range from advocacy journalism to carefully reasoned argument and rigorous sifting of evidence. I particularly recommend the papers by David T. Kingsbury, Gladys B. White, Susan Wright, Frederick Buttel, and Bernard Rollin.

The papers suggest that the Iowa conference was characterized by at least as much interdisciplinary aggression as interdisciplinary dialogue. The deep concerns about the health and socioeconomic effects of biotechnology were typically expressed by those who, on the basis of their papers, had neither the analytical tools or the knowledge to assess their concerns. The least concern was expressed by those who had command over the technical and scientific materials but only limited insight into the workings of the social systems into which the technology is being introduced. There was a tendency on the part of the social scientists and ethicists to regard the views of the biologists and science policy participants as excessively narrow and for the biologists and science policy participants to view the contributions of the social scientists and ethicists as superficial. Both characterizations were frequently correct. I was disappointed at the general lack of rigor in the discussion of ethical issues by the participants who should have been most capable of bringing their analytical capacity to bear on these issues. I am somewhat puzzled by the intensity of the debate surrounding the potential of bGH. From an economic perspective, the introduction of bGH is unlikely to be any more significant than several other technical changes that have occurred in the dairy industry over the last several decades. When cast within the historical context of growth in output per cow, from just a bit over 5000 pounds per year in 1950 to approximately 14,000 pounds per year in 1990, bGH seems more like an incremental rather than a revolutionary change.

It was particularly puzzling that even those who argued for a "holistic" rather than a "partial" approach to advances in biological technology treated agriculture as an "island empire" disconnected with the rest of society. This deficiency was most serious in the inconclusive discussions about the appropriate policies to deal with the impact of biotechnology, and of bGH in particular, on agricultural structure. The question that should have been discussed is whether it is more appropriate to press forward specific remedies to specific impacts or to work toward generalized protection against the broad range of effects of structural change induced by technological and institutional change. Only generalized protection is consistent with the objective of economic growth. An economy which provides substantial alternative opportunities for those displaced by bGH (or by an Apple computer or by an imported Toyota)

substantially reduces the imperative to provide specific protection.

I should make my own position clearer. In spite of the above criticisms, I find myself in general agreement with the philosophical perspective expressed by several of the social scientists and ethicists--there can be no question about the right of society to hold the science community responsible for the consequences of the technical and institutional changes set in motion by research. However, once the right of society to hold its scientific community responsible for the effects of the knowledge and technology they provide is accepted, it is then possible to deal with the more tractable question of how much responsibility a wise society will impose on its research community. Technology represents a weak instrument for social and economic reform. The appropriate and more effective instruments are largely institutional. Thus, it is possible to argue that a wise society will let the burdens of responsibility rest lightly on the shoulders of individual researchers and research managers. If society insists that it be assured that the advances in agricultural technology carry minimum health risks or minimum impact on economic or social organization, society must accept the risk of losing access to the benefits generated by technical change. It is clearly society's right, and its responsibility, to make such choices. **Vernon W. Ruttan**, *Department of Agricultural and Applied Economics, University of Minnesota*.

The Struggle for the Land: Indigenous Insight and Industrial Empire in the Semiarid World. Paul A. Olson. Lincoln: University of Nebraska Press, 1990. x + 317 pages. Maps, tables, figures, and references. \$35.00 cloth (ISBN 0-80323555-0)

This book is based on the premise that solutions to the problems experienced by many resource management programs currently underway in the semiarid regions of the world can be found in indigenous systems of resource use. Developing out of a 1986 interdisciplinary symposium sponsored by the Center for Great Plains Studies, the book has contributors from agricultural development, anthropology, economics, english, environmental studies, history, law, native studies, and philosophy. Given the magnitude of the human and environmental problems in semiarid lands, a book intended to provide an indigenous counterpoint, as it were, to present use of those areas would not only be timely, but essential.

The book is divided into four parts with an introduction and conclusion. For the most part, the essays conform to the central issue of the book. Part 1 includes two essays by anthropologists John Bennett and