Session 2
Past, Present, and Emerging Concepts in Applied Biological Research

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Introduction to Session 2

Past, Present, and Emerging Concepts in Applied Biological Research

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This session of the 16th Symposium was dedicated to Dr. Charles D. Scott for initiating and organizing this annual event, as well as for his contributions in the field of bioprocessing and biotechnology for production of fuels and chemicals. The first Symposium was held in Gatlinburg, Tennessee, on May 10–12, 1978. The U.S. Department of Energy (DOE) and Oak Ridge National Laboratory (ORNL) sponsored the first meeting, as they have every meeting since.

Chuck Scott organized and chaired the first Symposium and continued in these roles until he passed the torch to others following the tenth Symposium held in 1988. Members of the Organizing Committee for the first Symposium were C. W. Hatcher and W. W. Pitt, Jr., from ORNL; and R. Robinson and G. E. Stapleton from DOE.

The following five sessions were included in the program for the first Symposium. The chairs and co-chairs are listed for each session:

Session I Advanced Biotechnology Concepts
S. W. Drew, Virginia Polytechnic Institute and State University
S. E. Shumate II, Oak Ridge National Laboratory

Session II. Bioconversion for Chemicals and Intermediates
E. K. Pye, University of Pennsylvania School of Medicine
G. W. Strandberg, Oak Ridge National Laboratory

Session III. Recovery of Gaseous Fuels and Other Resources
D. K. Walter, Department of Energy
R. K. Genung, Oak Ridge National Laboratory

Session IV. Environmental Control Technology
J. H. Koon, Associated Water and Air Resources Engineers, Inc.
J. A. Klein, Oak Ridge National Laboratory

Session V. Biomimetic and in vitro Processes
J. J. Katz, Argonne National Laboratory
R. M. Pearlstein, Oak Ridge National Laboratory

As Chuck Scott gets ready for retirement at the end of 1994, it is appropriate to reflect on some of his wisdom and insight on the application of biotechnology to the production of fuels and chemicals—the focus of the annual Symposium. In the introduction to the first Symposium, he noted that:

> "In the past, biotechnology has been successfully applied to a variety of process problems and is still extensively used in areas such as pharmaceutical manufacture and wastewater treatment; however, it currently does not have a significant impact on major commercial operations. In fact, until recently, the application of modern process development techniques to biotechnology was primarily carried out in only a few academic institutions and certain progressive companies. Now there are numerous indications that the interest in utilizing biotechnology is gaining momentum, both nationally and internationally. Process development engineers are joining biological scientists, environmental engineers, and others in investigating innovative and productive ways of using biological systems. This is particularly true in the field of energy production and conservation, especially if the total effort, including environmental control and fuel production, is considered."

Since the first Symposium, Chuck Scott has made many more insightful observations. He noted that "production of fuels and chemicals from biomass is an ancient tradition that is once again important." He predicted that "advances in bioprocessing will lead to significant increases in biomass utilization for fuels and chemicals." In the first Symposium, Chuck sought to "bring together the various disciplines and institutions involved in developing viable new biotechnology for conversion of biomass to fuels and energy-intensive chemical feedstocks; for direct conversion to electrical power; for alternatives to energy-intensive resource recovery, including fuel values; and for environmental control technology associated with energy production." As he has since said, "We must create biomass refineries," and, "Biomass refineries must be 'high tech' systems." He has also stated that "herbaceous biomass will become more important than woody biomass in such refineries."

To celebrate Charles D. Scott's contributions to the field and his initiation of the annual Symposium, leaders in the application of biotechnology for production of fuels and chemicals were asked to share their perspectives on the field in this special session. First, Chuck Scott spoke about "The Prospect for Production of Fuels and Chemicals from Biomass" in which he reflected on the directions of the past and the potential for the future. Doug Eveleigh, from Rutgers University, followed with a talk entitled "Biotechnology for Fuels and Chemicals: The Microbe's Perspective," in which he discussed important microorganism developments. Charles Wyman, from the National Renewable Energy Laboratory, presented "The

Status and Potential of Liquid Fuels Production from Biomass." His focus was on the development and promise of ethanol production from lignocellulosic biomass and biodiesel fuel production from oil crops. Michael Ladisch, from Purdue University, discussed "Advances in Energy Drying of Fuel Ethanol During the Last Sixteen Years," in which several options for significant reductions in energy use and costs were outlined. Ruxton Villet, from the Department of Agriculture, spoke on "High-Value Co-products: A Strategy in Biofuels Manufacture" and featured a video tape of an interview on the topic. At the conclusion of the session Daniel Wang, from Massachusetts Institute of Technology, provided his perspective on "Future Impact of Biotechnology on Fuels and Chemicals Production," in which he emphasized his views on higher-value products.

Through Charles D. Scott's leadership and dedication to the field, the annual Symposium has provided an important vehicle that facilitates the exchange of information on the application of biotechnology to produce fuels and chemicals. It has brought together researchers from a wide range of institutions and with diverse interests in biotechnology. To date, including this edition, 16 technical volumes have documented some of the information shared at the meetings. However, those attending the Symposium have gained far more than these records in terms of the fruitful technical interactions, collaborations, and friendships that have resulted. The meeting has truly been a successful forum to facilitate the emergence of this field. We can all thank Chuck for making this all possible and wish him the best in his new life.

Thank you, Chuck!