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ORNL

FOREIGN TRIP REPORT

ORNL/FTR-2979

DATE: August 3, 1988

SUBJECT: Report of Foreign Travel, Charles D. Scott, Senior Corporate Fellow, Chemical Technology Division

TO: A. Zucker

FROM: Charles D. Scott

PURPOSE: To present paper and participate in the 8th International Biotechnology Symposium at Paris, France, and to present a seminar and carry out discussions at the Institut National des Sciences Appliqueés in Toulouse, France.

SITES VISITED:	7/17-22/88	8th International Biotechnology Symposium Paris, France	G. Durand
	7/28/88	Institut National des Sciences Appliqueés, Toulouse, France	G. Goma

ABSTRACT: The traveler presented a paper on advanced bioreactors for ethanol production at the 8th International Biotechnology Symposium and participated in the meeting. An invited seminar on advanced biotechnology concepts was presented at the Institut National des Sciences Appliqueés in Toulouse. Extensive discussions on bioprocessing applications were also carried out at the Institute.

REPORT OF TRAVEL TO FRANCE

July 15-31, 1988

Charles D. Scott

The primary purposes of this trip were to participate in the 8th International Biotechnology Symposium by presenting a paper entitled "Ethanol Production from Industrial Feedstocks by Immobilized Zymomonas mobilis in a Fluidized-Bed Bioreactor," and to visit the Institut National des Sciences Appliquées (INSA). This report consists of two parts given in chronological order. First, an overview is given of the 8th International Biotechnology Symposium and then a summary is presented of the discussions held at the INSA.

I. 8th INTERNATIONAL BIOTECHNOLOGY SYMPOSIUM

This symposium series, with a meeting every four years, has evolved into the most encompassing meeting on biotechnology. There were over 2500 participants from all areas of the world, with approximately 1000 papers and a major equipment exhibition. The traveler participated in many sessions during the six-day conference and presented a paper on "Ethanol Production from Industrial Feedstocks by Immobilized Zymomonas mobilis in a Fluidized-Bed Bioreactor."

The meeting was organized with 21 concurrent formal sessions, four poster sessions, and several round table discussion groups. The traveler's main interest and participation was in those research areas associated with the kinetics and dynamics of bioreactors. Research highlights presented at the meeting included new approaches to enhancing mass transfer in bioreactor systems, new methods for mathematical modeling

of bioreactors, and the use of recombinant DNA techniques for enhanced microorganisms in advanced bioreactor configurations. The traveler's paper represented one of the few that presented innovative bioreactor concepts. It was very well received, with over 30 requests for additional information. A book of abstracts was obtained and will be distributed to interested staff members.

The next meeting in this symposium series will be held in Washington, D.C., in 1992. It would be most appropriate for there to be several participants from ORNL at that meeting.

II. INSTITUT NATIONAL DES SCIENCES APPLIQUEÉS

The Institut National des Sciences Appliqueés is associated with the Universite Paul Sabatier and other research organizations in Toulouse, France. There are several cooperative departments and centers that are associated with the biological sciences and technology. My host, Prof. G. Goma, is the Director of the Department of Biochemical Engineering and of the Center for Transport Processes in Microbial Biotechnology, both within the INSA. He and his 80 plus colleagues carry out the most significant research on bioreactor systems in France. They are primarily interested in classical stirred-tank bioreactors and in membrane bioreactors, especially those that are directly coupled with separation systems. Much of their current research is directed towards the enhancement of mass transfer within bioreactors and the investigation of ceramic-type membranes.

I presented a seminar on "Advanced Columnar Bioreactor Systems" that was attended by about one-half of Prof. Goma's staff, even though

that was the day before the Institute closed down for the summer holiday. There was a significant amount of interest and an indication that columnar bioreactors could be a new initiative for them.

APPENDIX A

ITINERARY

July 15-16, 1988	Travel to Paris, France
July 17-22, 1988	Participate in 8th International Biotechnology Symposium
July 23-24, 1988	Weekend
July 25-27, 1988	Vacation and travel to Toulouse, France
July 28, 1988	Visit INSA, Toulouse, France
July 29, 1988	Travel to Paris, France
July 30, 1988	Traveler's time (could have returned to U.S.)
July 31, 1988	Travel to Oak Ridge, Tennessee

APPENDIX B

PERSONS CONTACTED

Prof. J. E. Bailey	California Institute of Technology Pasadena, CA 91125
Prof. H. Blanch	University of California, Berkeley Berkeley, CA 94720
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Dr. T. K. Ghose	Jadavpur University Calcutta 32, India
Prof. G. Goma	Institut National des Sciences Appliqueés Avenue de Rangueil 31077 Toulouse Cedex, France
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