THOMAS RICHARD HANLEY

Present Position Vice President and Professor of Chemical Engineering (on leave), Auburn University

Education
B. S., Chemical Engineering, 1967, Virginia Polytechnic Institute, Blacksburg, Virginia
M. S., Chemical Engineering, 1971, Virginia Polytechnic Institute and State University, Blacksburg, Virginia
Ph. D., Chemical Engineering, 1972, Virginia Polytechnic Institute and State University, Blacksburg, Virginia
M. B. A., Management, 1975, Wright State University, Dayton, Ohio

Other Training
Major Gift Fund Raising for Deans, Council for Advancement and Support of Education, Washington, D. C., 1995.
Development for Academic Deans, Council for Advancement and Support of Education, Washington, D. C., 1992.
Bioprocess Equipment Design, American Society of Mechanical Engineers, Charlottesville, Virginia, 1990.
ChE Laboratory Module Workshop, Purdue University, West Lafayette, Indiana, 1990
Introduction to Microprocessors, Intel Corporation, Dallas, Texas, 1985.

Past Positions Provost and Vice President for Academic Affairs and Professor of Chemical Engineering at Auburn University (2003-2005); Dean of Engineering and Professor of Chemical Engineering at the University of Louisville (1991-2003); Professor and Chairman of Chemical Engineering at Florida State University/Florida A&M (1985 - 1991); Professor and Head of Chemical Engineering at Louisiana Tech University (1983 - 1985); Associate Professor of Chemical Engineering at Rose-Hulman Institute of Technology (1979 - 1983); Assistant Professor of Chemical Engineering at Tulane University (1975 - 1979); Development Engineer at the U. S. Air Force Materials Laboratory (1972 - 1975)

Research Contracts and grants totaling over $3.1 million have been funded by the National Science Foundation, the National Renewable Energy Laboratory, General Electric, Colgate-Palmolive, United Catalysts, Stone & Webster, Swan Biomass, IKA Works, Toro, U. S. Bioreactor, Olin Corporation, the Semiconductor Research Corporation, the Florida High Technology and Industry Council, the Florida Department of Environmental Regulation, the Louisiana Department of Natural Resources, the National Institutes of Health, Morton-Thiokol, IMC Corporation, the U. S. Department of Energy, the U. S. Department of Agriculture, and Union Carbide. He has directed 70 student research projects, including 11 Ph. D. dissertations and 27 masters theses.

Papers Dr. Hanley is the author of over 65 papers appearing in *AIChE Journal*, *I&EC Fundamentals*, *Journal of Applied Polymer Science*, *Chemical Engineering Education*, *Biotechnology and Bioengineering*, *AIChE Symposium Series*, *Chemical Engineering Communications*, *Chemical Engineering Science*, *Applied Biochemistry & Biotechnology*, and *ASHRAE Journal*. He edited *The AIChE Pocket Handbook* for the American Institute of Chemical Engineers. He has authored over 225 presentations, including technical presentations at meetings of the American Institute of Chemical Engineers, the American Society for Engineering Education, the American Chemical Society, the American Society for Engineering in Medicine and Biology, the American Society of Mechanical Engineers, the Engineering Foundation, the International Society

for Oxygen Transfer to Tissue, the American Defense Preparedness Association, and the Southern Biomedical Engineering Conference.

Courses Taught Introduction to Chemical Engineering, Introduction to Engineering, Material and Energy Transport Phenomena, Thermodynamics, Chemical Kinetics, Physical Chemistry, Unit Operations, Engineering Economics, Unit Operations Laboratory, Reactor Design, Plant Design, Microelectronic Materials, Polymer Engineering, Biochemical Engineering, Industrial Mixing, Corrosion Engineering, Polymer Processing, Advanced Engineering Mathematics, Process Dynamics, and Computational Fluid Dynamics

Board Positions and Consulting Dr. Hanley is a member of the Board of Directors of Plasticolors, Inc. and the American Institute of Chemical Engineers. He is a member of the Michigan Tech University Engineering Industrial Advisory Board and Virginia Tech College of Engineering Committee of 100. He served as a board member of the Louisville/Jefferson County Redevelopment Authority, the Kentucky State Board of Registration for Professional Engineers and Land Surveyors and the Kentucky Partners Pollution Prevention Center. He served the National Science Foundation on the Divisional Advisory Committee for Biological and Critical Systems and the Divisional Advisory Committee for Chemical, Biochemical, and Thermal Engineering. He was a board member of the Louisville Advanced Technology Council for five years, serving as Board President in 1996. He has consulted for Swan Biomass, Louisville Gas and Electric, Brown and Williamson, KFC, Olin, Kraft, IMC Corporation, El Paso Polyolefins, Chevron Chemical, and Edgewood Arsenal.

Honors & Awards Phi Kappa Phi (1967), Tau Beta Pi (1967), Phi Lambda Upsilon (1967), Distinguished Military Graduate (1967), Society of American Military Engineers Award (1966 and 1967), American Legion Academic Award (1967), Sigma Xi (1977), Omega Chi Epsilon (1977), Outstanding AIChE Student Chapter Advisor (1979), SAE Ralph R. Teetor Educational Award (1989), KSPE Outstanding Engineer in Education Award (1994), AIChE Fellow (1995), ASEE/CIEC College Industry Partnership Division Best Presentation Award (1996)

Societies American Institute of Chemical Engineers, American Society of Engineering Education, Leadership Louisville, Leadership Kentucky, National Association of State Universities and Land-Grant Colleges

Personal Dr. Hanley is married to Norma Kathryn (Decker), and they have four children: Thomas Jeffrey, Alan Michael, Andrew Richard, and Caitlin Marisa. College activities included varsity basketball and the Corps of Cadets. He was a player-coach in the Air Force and an assistant basketball coach at Tulane and Rose-Hulman. Other interests include coin collecting and skiing.

Administrative Accomplishments

Provost and Vice President for Academic Affairs, Auburn University (2003-05). Administrative responsibility for twelve colleges, the library and information technology with shared responsibility for research, outreach and student affairs. The university consists of over 7,000 faculty and staff and 23,000 students with an overall annual budget of over $575 million.

- A multi-component assessment program was developed including a capacity study, a zero-base budget analysis based in teaching requirements and college and department performance assessment.
- Goals with respect to enrollment, research, gifts/endowment and image were established. A scorecard measuring progress toward these goals was developed.
- A scholarship program designed to improve diversity and student quality was initiated.
- Auburn's enrollment management group has been highly effective in setting freshman enrollment while increasing both the quality and diversity of the freshman class.

Dean, Speed Scientific School, University of Louisville (1991-2003). Administrative responsibility for six departments and four centers consisting of 95 faculty, 60 staff, and 2100 students with an overall annual budget of over $24 million.

- Funded research increased by a factor of ten.
- School endowment increased from under $5 million to over $50 million with endowment used to create endowed chairs, doctoral fellowships and a supercomputer support fund.
- The Speed Society was established to recognize cumulative giving from alumni and friends.
- The Rapid Prototype Center, developed with a total investment of over $2.5 million, secured seventy-five percent of the required funding through over 80 industrial members.
- Proposals for new Ph. D. programs in Mechanical Engineering, Electrical Engineering and Civil Engineering were developed, approved and implemented.
- The Kentucky Pollution Prevention Center, a state-mandated center focusing on hazardous waste reduction, was secured. This program received funding of approximately $400,000 per year by state line-item funding and generated approximately $500,000 per year in outside funding.
- Three supercomputers with 176 CPUs provided supercomputer access to all university faculty members.
- The Institute for Bioengineering, a collaboration with the School of Medicine and local hospitals, was established.
- The $15 million Lutz Building, housing 17 new multidisciplinary research laboratories with faculty and student offices, was completed in early 1997. The Baxter II Biomedical Research Building, completed in 2002, housed six bioengineering laboratories.

- The Industrial Board of Advisors (approximately 50 members) was formed and played as active role in working with the school in the areas of development, assessment, graduate surveys, public image, new academic programs and rapid prototyping.

- Successful accreditation visits by the Accrediting Board for Engineering and Technology (ABET) were completed in 1994 and 2000.

- A student recruitment video and an economic development video were produced and distributed.

- A graduate intern program supported by local industry was developed.

- A joint Master of Engineering/Master of Business Administration program was established in cooperation with the College of Business and Public Administration

- Successful graduate programs were developed in Cairo, Egypt and Panama City, Panama.

Department Chair, FAMU/FSU College of Engineering (1985-1991)

- A joint program in Chemical Engineering for Florida State University and Florida A&M University was initiated and established with major goals being the development of a quality program at the undergraduate and graduate levels with an emphasis on minorities and women.

- The Bachelor of Science program was accredited by ABET in 1986 with the first graduates.

- The Master of Science degree program was implemented in January 1988.

- The Doctor of Philosophy degree program was implemented in September 1989.

Permanent Positions

2003-2005. Provost and Vice President for Academic Affairs and Professor of Chemical Engineering, Auburn University, Auburn, Alabama

1991-2003. Dean of Engineering and Professor of Chemical Engineering, University of Louisville, Louisville, Kentucky

1985-1991. Professor and Chair of Chemical Engineering, Florida State University and Florida A&M University, FAMU/FSU College of Engineering, Tallahassee, Florida

1983-1985. Professor and Head of Chemical Engineering, Louisiana Tech University, Ruston, Louisiana

1979-1983. Associate Professor of Chemical Engineering, Rose-Hulman Institute of Technology, Terre Haute, Indiana

1975-1979. Assistant Professor of Chemical Engineering, Tulane University, New Orleans, Louisiana

1974-1975. Development Engineer, Lubricants Branch, Materials Laboratory, Wright-Patterson AFB, Ohio

1972-1974. Development Engineer, Polymers Branch, Materials Laboratory, Wright-Patterson AFB, Ohio

1970-1972. Graduate Teaching Assistant, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

1969-1970. Manufacturing Engineer and Project Leader, Electro-Tec, Blacksburg, Virginia

Funded Contracts and Grants

2001-2004 (36 Months). Reactor Design for Biorefineries Using Computational Fluid Dynamics, National Renewable Energy Laboratory, Golden, Colorado.
Principal Investigator: Funding: $599,844

1997-2000 (40 months). Analysis of the Flow of Dental Cream Through Fill Nozzles Using CFD Analysis, Colgate-Palmolive Company, Piscataway, New Jersey.
Principal Investigator: Funding: $50,340

1998-1999 (16 months). Agitation Testing and Demonstration for VX Neutralization Reactor, Stone and Webster Engineering Corporation, Boston, Massachusetts.
Principal Investigator: Funding: $158,311

1996-1998 (36 months). Ethanol Production from Lignocellulose Feedstocks - Laboratory Production and Simulation of Pilot-Scale and Full-Scale Facilities Using FLUENT, Swan Biomass Company, Downers Grove, Illinois.
Principal Investigator: Funding: $27,859

1995-1998 (38 months). Mixing Analysis of H217 Catalyst Production, United Catalysts, Incorporated, Louisville, Kentucky.
Principal Investigator. Funding: $122,564

1995-1998 (36 months). An Advanced Undergraduate Laboratory for Microfabrication, National Science Foundation, Washington, District of Columbia.
Senior Associate (K. Walsh - Principal Investigator). Funding: $373,382.

1996-1997 (9 months). Optimization of Rotor-Stator Type Continuous Dispersing Machines Using FLUENT, IKA Works, Inc., Wilmington, North Carolina.
Principal Investigator: Funding: $15,154

1996-1997 (6 months). Flow Analysis of a Nozzle Using FLUENT, Toro Company, Riverside, California.
Principal Investigator. Funding: $10,502

1995 (4 months). A Multi-Use Bioreactor for Tissue and Cell Culture, Kentucky SBIR Bridge Grant Program, Frankfort, Kentucky, through U. S. Bioreactor Company, Louisville, Kentucky.
Principal Investigator. Funding: $14,593

1994-1995 (2 months). Mixing Analysis of Product Delivery Systems Using FLUENT, Colgate-Palmolive Company, Jeffersonville, Indiana.
Principal Investigator. Funding: $5,395

1993-1994 (19 months). Impingement Reactive Mixing Analysis of Insulating Foams, General Electric Company, Louisville, Kentucky.
Principal Investigator. Funding: $73,211

1993-1994 (12 months). Energy Analysis and Diagnostic Center, University City Science Center, Philadelphia, Pennsylvania.
Faculty Investigator (J. C. Watters and R. E. Stewart, Co-Principal Investigators).
Funding: $88,312

1990-1994 (49 months). Analysis and Optimization of Mycelial Fermentors, National Science Foundation, Washington, District of Columbia.
Principal Investigator. Funding: $184,509

1990-1991 (12 months). Degradable Plastics Certification. Florida Department of Environmental Regulation, Tallahassee, Florida.
Principal Investigator. Funding: $17,121

1989-1991 (16 months). Energy Efficient Industrial Processes/Equipment Demonstration Project. Governor's Energy Office, State of Florida, Tallahassee, Florida.
Principal Investigator. Funding: $288,000

1987-1991 (48 months). Modeling Solvent Removal in the Ball Powder Propellant Process, Olin Corporation, St. Marks, Florida.
Principal Investigator. Funding: $185,126

1986-1991 (60 months). Microelectronics Processing Engineering Program. Semiconductor Research Corporation, Research Triangle, North Carolina.

Principal Investigator and Faculty Investigator. Funding: $300,000

1989-1990 (12 months). The Center for Mixing Studies: The Planning Stage. Council on Research and Creativity, Florida State University, Tallahassee, Florida.
Principal Investigator. Funding: $6,000

1989 (10 months). Commercial Products Packaging Impact on Solid Waste Management, Florida Center for Solid and Hazardous Waste, Gainesville, Florida, through the University of South Florida, Tampa, Florida.
Principal Investigator. Funding: $32,545

1989 (6 months). Waste Reduction Assistance Program. Florida Department of Environmental Regulation, Tallahassee, Florida.
Principal Investigator. Funding: $7,200

1989 (4 months). Solid Waste Recycling - Plastic and Rubber, Florida High Technology and Industry Council, Tallahassee, Florida, through the University of South Florida, Tampa, Florida.
Principal Investigator. Funding: $10,080

1987-1989 (23 months). Industrial Energy and Cogeneration Surveys in Florida, Governor's Energy Office, State of Florida, Tallahassee, Florida.
Principal Investigator. Funding: $112,272

1986-1987. AT&T Computer Donation Program, AT&T Information Systems, Morristown, New Jersey.
Grant Initiator. Grant Funding: $394,100

1986-1987 (12 months). Pesticide Rinse Water Recycling System. STAR grant through Florida Department of Environmental Regulation, Tallahassee, Florida.
Co-principal Investigator. Funding: $42,225

1985 (7 months). Small Manufacturers Audit, Louisiana Department of Natural Resources, Baton Rouge, Louisiana
Co-principal Investigator. Funding: $16,487

1985 (2 months). Models for Heterogeneous Systems Analysis, National Institutes of Health through the University of Alabama-Birmingham, Birmingham, Alabama
Principal Investigator. Funding: $38,229

1984-1985 (6 months). Removal of Sodium Chloride from Brine with Methylenedianiline, Tarco Environmental Services, Haughton, Louisiana
Principal Investigator. Funding: $20,256

1984-1985 (16 months). Analysis and Correlation of Composition B Test Data, Morton-Thiokol, Incorporated, Shreveport, Louisiana
Principal Investigator. Funding: $12,500

1984-1985 (12 months). Simulation Strategies for Heterogeneous Systems Analysis, National Institutes of Health through the University of Alabama-Birmingham, Birmingham, Alabama
Principal Investigator. Funding: $36,264

1984-1985 (12 months). Thermal Modeling of Projectiles for Cast Defect Analysis, Morton-Thiokol, Incorporated, Shreveport, Louisiana
Principal Investigator. Funding: $10,800

1983-1984 (12 months). Purification of Phosphoric Acid by Electrodialysis, International Minerals and Chemicals Corporation, Terre Haute, Indiana
Principal Investigator. Funding: $10,900

1983-1984 (11 months). Second Law of Thermodynamics Review, Department of Energy through the Louisiana Department of Natural Resources, Baton Rouge, Louisiana
Co-principal Investigator. Funding: $15,017

1981 (3 months). Micromixing Effects in CSTR's, General Electric Faculty Research Initiation and Development Program.
Principal Investigator. Funding: $2,000

1978-1979 (12 months). Pressure Retarded Osmosis for Waste Heat Recovery, Department of Energy through ITC/Solar and Gulf South Research Institute, New Orleans, Louisiana
Principal Investigator. Funding: $28,500

1978-1979 (12 months). Mathematical Modeling of a Tenter Frame Dryer, U. S. Department of Agriculture, SRRC, New Orleans, Louisiana.
Faculty Investigator. Funding: $8,000

1977-1978 (12 months). Accelerated Physical Testing of Biopolymers, National Institute of Health/Biomedical Research Support Grant.
Principal Investigator. Funding: $900

1976-1978 (24 months). Evaluation of Clinical Artificial Kidneys, National Institute of Health/Biomedical Research Support Grant.
Principal Investigator. Funding: $4,600

1976-1977 (12 months). Simulation and Control of Wastewater Systems, Union Carbide Corporation, Taft, Louisiana.
Principal Investigator. Funding: $20,000

Graduate Students Directed

Telotte, J. C.: Micromixing Effects on Continuous Flow Stirred Tank Reactor Performance, Masters Thesis, Tulane, 1979.

Armer, T. A.: Characterization of Mass Transfer in the Hollow Fiber Artificial Kidney, Masters Thesis, Tulane, 1979.

Akmal, K. A.: Pressure Retarded Osmosis as a Means of Waste Heat Recovery, Masters Thesis, Tulane, 1979. (with N. L. Book and L. J. Groome).

McCall, M. N.: A Study of the Feasibility of Anaerobic Digestion of Water Hyacinth for the Production of Methane, Directed Research, Tulane, 1979.

Hippler, J. G.: Concentration Fluctuation Variance as a Measure of Reactor Segregation, Masters Thesis, Rose-Hulman, 1982.

Liekhus, K. J.: The Use of Micromixing Models to Predict Reactor Performance, Masters Thesis, Rose-Hulman, 1984.

Chiu, H. K.: Phosphoric Acid Concentration by Electrodialysis, Masters Thesis, Rose-Hulman, 1984.

Ali, T. K.: Thermal Modeling of the 155mm HE M107 Projectile during Composition Cooling and Solidification, Directed Research, Louisiana Tech, 1984.

Ridgway, D.: Determination of Mass Transfer Coefficients in Agitated Gas-Liquid Vessels Using Instantaneous Reaction, Doctoral Dissertation, Florida State University, 1990.

Liekhus, K. J.: Solvent Diffusion from Polymeric Spheres in Continuous-Flow Systems, Doctoral Dissertation, Florida State University, 1990.

Franklin, E. L.: Temperature and Pressure Effects on the Phase Behavior of Nitrocellulose Lacquers, Masters Thesis, Florida State University, 1991.

Carrillo, R. E.: Rheological Characterization of Simulated Mycelial Broths, Masters Thesis, University of Louisville, 1993.

Sunderhaus, T. D.: Determination of Heat Transfer Rates in Combi Ovens Using Model Systems, Masters Thesis, University of Louisville, 1994.

Rister, J. E.: Effects of pH and Glucose Concentration on the Production of Gluconic Acid by *Aspergillus Niger*, Masters Thesis, University of Louisville, 1994.

Hale, J. T.: Effects of Impingement Mixing on the Production of Polyurethane Foam, Masters Thesis, University of Louisville, 1994.

Berson, R. E.: Gas-Phase Residence Time Distributions in a Tall Tank, Masters Thesis, University of Louisville, 1995.

Choudhary, S.: Simulation of Impingement Mixing for Polyurethane Insulative Foams, Masters Thesis, University of Louisville, 1995.

Tinsley, D. A.: Gas Residence Time Distributions in Three Phase Reactors, Masters Thesis, University of Louisville, 1995.

Donnelly, J. A.: Measurement of the Rheology of Filamentous Suspensions Using Vane Impeller and Rushton Turbine Methods, Masters Thesis, University of Louisville, 1995.

Dronawat, S. N.: Mixing in Bioreactors: An Investigation of Oxygen Transfer and Rheology , Doctoral Dissertation, University of Louisville, 1996.

Huang, F.: CFD Simulation and Verification of Flow in Mixing Tanks, Doctoral Dissertation, University of Louisville, 1997.

Shafie, M.: The Effect of Agitation on the Enzymatic Hydrolysis of Cellulose, Masters Thesis, University of Louisville, 1997.

Rieth, T. C.: Measurement of the Rheology of Filamentous Suspensions Using a Helical Impeller Viscometer, Masters Thesis, University of Louisville, 1997.

Mane, T.: Optimization of Oxygen Delivery in a Continuous Perfusion Roller Bottle Reactor, Masters Thesis, University of Louisville, 1997.

Pastorino, S. A.: Fermentation and Separation Optimization for the Recovery of Phenyl Ethyl Alcohol, Masters Thesis, University of Louisville, 1998.

Svihla, S.: Design of a Low-Power Agitation System for Simultaneous Saccharification and Co-Fermentation Process Using Computational Fluid Dynamics, Masters Thesis, University of Louisville, 1998.

Svihla, C. K.: A Study of the Effect of Solids Concentration on Gas-Liquid Mass Transfer for Filamentous Suspensions in Sparged Agitated Vessels, Doctoral Dissertation, Florida State University, 1999.

Berson, R. E.: Mixing, Mass Transfer and Monoclonal Antibody Production in a Novel Continuous Perfusions Roller Bottle Reactor, Doctoral Dissertation, University of Louisville, 2000.

Ibrahim, W.: Mixing Analysis of a Steam-Sparged Mixed Reactor , Masters Thesis, University of Louisville, 2000.

Friederichs, G.: Removal of Heparin from Whole Blood Using Affinity Adsorption Hollow Fiber Membranes, Doctoral Dissertation, University of Louisville, 2001.

Priddy, S. A.: Effect of Acetic Acid on Biorefinery Pretreatment Detoxification and Fermentation, Doctoral Dissertation, University of Louisville, 2002.

Shafie, M.: The Role of Hydrodynamics and Mass Transfer in Suspension Cultures of DU145 Human Prostate Carcinoma Cells, Doctoral Dissertation, University of Louisville, 2003.

Houchin, T. L.: Measurement of the Rheology of Distillers' Grain Slurries Using a Helical Impeller Viscometer, Masters Thesis, University of Louisville, 2003.

Pimenova, N. V.: Viscosity Determination of Corn Stover Slurries Used for Ethanol Production, Masters Thesis, University of Louisville, 2003.

Newell, W. F.: Redesign of a Continuous Perfusion Roller Bottle Reactor, Masters Thesis, University of Louisville, 2003.

Singleton, D.: Shell Side Flow Distribution in Hemodialyzers, Masters Thesis, University of Louisville, 2003.

Svihla, S. P.: Design of Agitation Systems in Large-Scale Bioreactors Using Computational Fluid Dynamics, Doctoral Dissertation, University of Louisville, 2004.

Kamer, S. N.: Effects of Agitation on Reactor Scale-up of *Zymomonas mobilis* Fermentation, Masters Thesis, University of Louisville, 2004.

Young, J. S.: Instantaneous Detoxification and Fermentation of *Zymomonas mobilis*, Masters Thesis, University of Louisville, 2004.

Um, B.-H.: Optimization of Biorefinery Ethanol Production from Pretreated Corn Stover, Doctoral Dissertation, Auburn University, in progress.

Senior Projects Directed

MacMurrough, J., and L. Berlanti: Pollution Correlations for Wastewater Treatment Facilities, Practice School Report for Union Carbide (Taft), Tulane, 1976.

Telotte, J. C.: Mixing Effects in Continuous Flow Stirred Reactors: Theory and Experimental Equipment Design, Senior Honors Thesis, Tulane, 1977.

Moore, J. S.: Industrial Sludge Disposal, Senior Honors Thesis, Tulane, 1977.

Mallinson, R. G.: Analysis of Mass Transfer in Artificial Kidneys Using Residence Time Distributions, Senior Thesis, Tulane, 1977.

Marcev, C., and J. Telotte,: A Model for Drying and Cooling at Ammonium Nitrate Prills via a Rotary Kiln, Practice School Report for Monsanto (Luling), Tulane, 1977.

Mallinson, R., and J. Moore: Improvements to the Secondary Waste Treatment System: Monitoring Effluent and Performance Enhancement, Practice School Report for Union Carbide (Taft), Tulane, 1977.

Hollingsworth, J., and V. Wilkerson: Heat and Material Balances for the EDA Column, Practice School Report for Union Carbide (Taft), Tulane, 1977.

Sellers, R. G.: Accelerated Physical Testing of Polymers for Use in Circulatory Assist Devices, Senior Honors Thesis, Tulane, 1978.

LeBlanc, M. S.: Evaluation of Cardiac Polymers in Accelerated Static Condition, Senior Thesis, Tulane, 1978.

Bourgeois, W. R. E.: Mass Transfer of Middle Molecules in Dialysis, Senior Honors Thesis, Tulane, 1978.

Barker, L., D. Canavier, T. Eckert, and M. Mantese: Computer Simulation of CR-1 Process: Optimal Energy Recovery by Additional Heat Exchangers, Practice School Report for Shell (Norco), Tulane, 1978.

Bourgeois, W., W. Boutall, A. Saurage, and D. Verplough: A Study of the Central Waste Treatment Plant, Practice School Report for Monsanto (Luling), Tulane, 1978.

LeBato, A.: The Design and Implementation of Transmembrane Pressure Control on the Hollow Fiber Artificial Kidney, Senior Honors Thesis, Tulane, 1979.

Ferry, J. A.: Lipid Absorption by Biomer: A Polyurethane with Potential for Use in Prosthesis, Senior Honors Thesis, Tulane, 1979.

Mencia, L., P. Stanfield, R. Wong, and B. Zollett: Evaluation of OLOA 260 Process: Naptha Loss Reduction and Energy Conservation, Practice School Report for Chevron (Oak Point), Tulane, 1979.

Bavaria, J., S. Kaaz, D. Hebert, and E. Young: Classification of Solid and Liquid Waste per RCRA and Louisiana Legislature Act 334, Practice School Report for Union Carbide (Taft), Tulane, 1979.

Hyman, J., J. Mayer, and O. Williams: Mathematical Modeling of the Drying of Cotton Fabric in a Tenter Frame Dryer, Practice School Report for USDA (New Orleans), Tulane, 1979.

Hippler, J. G.: A Circuit to Measure Concentration Fluctuations in a Flowing Liquid Stream, Directed Research, Rose-Hulman, 1980.

Taylor, M. E.: The Kinetics of Anaerobic Methane Production from Organic Feedstocks, Directed Research, Rose-Hulman, 1981.

Call, M. L.: Prediction of Mixing Effects in Stirred Reactors for Non-Linear Competitive Reactions, Directed Research, Rose-Hulman, 1981.

Billheimer, D. D.: Conversion of Pyrolysis Gases to Liquid Fuels via Fischer-Tropsch Catalysis: Experimental Equipment Design, Directed Research, Rose-Hulman, 1982.

Liekhus, K. J.: A Recalculated Mixing Model for a Continuous Stirred Tank Reactor, Directed Research, Rose-Hulman, 1983.

Renschler, A. J., Jr.: Investigation on the Suspension Stability and Wear Improvement Qualities of Molybdenum Disulfide, Directed Research, Rose-Hulman, 1983.

Taunton, D. J.: A Model for Mass Transport in Hollow Fiber Configuration, Directed Research, Louisiana Tech, 1984.

Chapman, S. E.: The Role of Activated Protein C in the Normal and Abnormal Regulation of the Human Fibrinolytic and Coagulation Systems, Directed Research, Louisiana Tech, 1985.

Vail, V. A.: Modeling Solvent Removal in a Ball Powder Process, Directed Research, Florida State, 1988.

Marchant, B. D.: Design and Construction of Conductivity Probes for Mixing Analysis, Directed Research, Florida State, 1988.

Carter, K. A.: Horizontal Thin-Film Evaporator Design and Operation, Directed Research, Florida A&M, 1990.

Carrillo, R. E.: Material and Energy Balances for a Continuous Shaper, Directed Research, Florida A&M, 1991.

Papers

1. Mallinson, R. G., and T. R. Hanley: The Application of Systems Analysis Techniques for the Evaluation of the Clinical Artificial Kidney, *30th ACEMB Proceedings*, **19**, 157(1977).

2. Mallinson, R. G., and T. R. Hanley: The Residence Time Distribution Analysis of Clinical Artificial Kidneys, **1977 Advances in Bioengineering**, ASME Press, 23(1977).

3. Hanley, T. R.: CSTR Mixing Models from Tracer Data, *Proceedings of NSF Workshop on Research Needs and Opportunities in Mixing Including Particulates*, 35(1977).

4. Hanley, T. R., and R. A. Mischke: A Mixing Model for a Continuous Flow Stirred Tank Reactor, *I&EC Fund.*, **17(1)**, 51-58(1978).

5. Mallinson, R. G., and T. R. Hanley: Comparison of Clinical Artificial Kidneys by Means of Residence Time Distribution Analysis, *Proceedings of the 62nd FASEB Annual Meeting*, **37(3)**, 216(1978).

6. Hanley, T. R., T. E. Helminiak, and C. L. Benner: Expansion of Aromatic Heterocyclic Polymers in Salt Solution, *J. App. Poly. Sci.*, **22(10)**, 2965-2978(1978).

7. Hanley, T. R., and J. M. Henry: Practice School: The Industrialization of Chemical Engineering Seniors, *Chem. Engng. Ed.*, **13(2)**, 84-86(1979).

8. Hanley, T. R., and R. A. Mischke: A Mixing Model for a Continuous Flow Stirred Tank Reactor - Comments, *I&EC Fund.*, **19(3)**, 327(1980).

9. Hanley, T. R.: The Effective Student Chapter, AIChE Student Members Bulletin, 17-18(1980).

10. Hanley, T. R., ed.: Proceeding of the 1979 Student Chapters Workshop, AIChE Student Members Bulletin, 11-16(1980).

11. LeBato, A. L., T. A. Armer, and T. R. Hanley: Transmembrane Pressure Control in Hollow Fiber Kidneys, *34th ACEMB Proceedings*, **23**, 351(1981).

12. Hanley, T. R., and C. B. Benham: Catalytic Conversion of Solar Thermal Produced Pyrolysis Gases to Liquid Fuels, *Biotechnol. Bioeng. Symp.*, **11**, 199-209(1981).

13. Armer, T. A., and T. R. Hanley: Mass Transfer Characterization in Hollow Fiber Kidneys.
Biomat., Med. Dev., Art. Org., **9(4)**, 327-33l(1981).
Biomedical Engineering I: Recent Developments, Pergamon Press, 272-275(1982).

14. Hippler, J. G., and T. R. Hanley: Measurement of Concentration Fluctuations in a Flowing Liquid Stream, *Indiana Academy of Science Proceedings*, **92**, 218(1983).

15. Hanley, T. R., and C. K. Svihla: Kinetics and Mixing Studies in a Mixed Flow Reactor, *92nd Annual ASEE Proceedings*, **3**, 1073-1077(1984).

16. Liekhus, K. J., and T. R. Hanley: Prediction of Oxygen Utilization in Brain Using Mixing Models, **Biomedical Engineering III: Recent Developments**, 107-111(1984).

17. Hanley, T. R., and K. J. Liekhus: The Effects of Mixing on Continuous Michaelis-Menten Reactions, *Advances in Experimental Medicine and Biology (Oxygen Transport to Tissue VI)*, **180**, 531-538(1984).

18. Armer, T. A., and T. R. Hanley: Characterization of Mass Transfer in Hollow Fiber Artificial Kidney, *Proceedings of the 189th National ACS Meeting*, 189, 1(1985).

19. Hanley, T. R.: Development and Utilization of an Industrial Board of Advisors, *93rd Annual ASEE Proceedings*, **2**, 567-570(1985).

20. Kufahl, R. H., and T. R. Hanley: A Multicomponent, Random Walk Model of Transport and Consumption in a Single Capillary Neuron System, **Biomedical Engineering IV: Recent Developments**, 71-75(1985).

21. Hanley, T. R., ed.: **The AIChE Pocket Handbook**, American Institute of Chemical Engineers, New York, NY, 1985.

22. Liekhus, K. J., and T. R. Hanley: A Mixing Model for a Continuous Flow Stirred Tank Reactor - Comments, *I&EC Fund.*, **25(1)**, 177(1986).

23. Hanley, T. R., H. K. Chiu, and R. J. Urban: Phosphoric Acid Concentration by Electrodialysis, *AIChE Symp. Ser.*, **248(82)**, 121(1986).

24. Armer, T. A., and T. R. Hanley: Characterization of Mass Transfer in the Hollow Fiber Artificial Kidney, *Chem. Engng. Comm.*, **47(1-3)**, 49-71(1986).

25. Buerk, D. G., P. K. Nair, E. W. Bridges, and T. R. Hanley: Interpretation of Oxygen Disappearance Curves Measured in Blood Perfused Tissues, *Advances in Experimental Medicine and Biology (Oxygen Transport to Tissue VIII)*, **200**, 151-161(1986).

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30. Hanley, T. R., D. Ridgway, C. K. Svihla, and L. C. Estabrook: Prediction of Cast Defects by Viscosity Analysis of a Molten Suspension, *Particulate Phenomena and Multiphase Transport*, **4**, 375(1988).

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32. Ridgway, D., R. N. Sharma, and T. R. Hanley: Determination of Mass Transfer Coefficients in Agitated Gas-Liquid Reactors by Instantaneous Reaction, *Chem. Engng. Sci.*, **44(12)**, 2935-42(1989).

33. Liekhus, K. J., and T. R. Hanley: Supercomputer Simulation of Mass Transfer from Spheres in a Series of Continuous-Flow Stirred Vessels, *Proceedings of the International Society for Mini and Microcomputers International Symposium Computer Applications in Design, Simulation, and Analysis*, MIMI '90, 49(1990).

34. Liekhus, K. J., and T. R. Hanley: Diffusion from Spheres in a Continuous-Flow Stirred Tank, *AIChE J.*, **36(7)**, 1011-1016(1990).

35. Hanley, T. R., and K. J. Liekhus: Solvent Extraction from Nitrocellulose Grains in a Continuous Evaporator, Nitrocellulose and Nitrocellulose-Based Propellants: Propellant Development and Characterization Subcommittee Workshop, **Chemical Propulsion Information Agency Publication 548**, 301(1990).

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38. Hanley, T. R.: Establishing a Ph. D. Program in a State University, *99th Annual ASEE Proceedings*, **1**, 160(1991).

39. Svihla, C. K., D. Ridgway, and T. R. Hanley: Comments on Determination of Mass Transfer Coefficients in Agitated Gas-Liquid Reactors by Instantaneous Reaction, *Chem. Engng. Sci.*, **47(5)**, 1329(1992).

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59. Priddy, S. A., and T. R. Hanley: Effect of Agitation on Removal of Acetic Acid from Pretreated Hydrolysate by Activated Carbon, *Appl. Biochem. & Biotech.,* **105/108**, 353-364(2003).

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61. Wan, Y., and T. R. Hanley: Flow Field in Shrinking-Bed Reactor for Pretreatment of Cellulosic Biomass, *Appl. Biochem. & Biotech.*, **105/108**, 593-602(2003).

62. Wan Y., and T. R. Hanley: Redesign of a Vertical Screw Conveyor Reactor Based on CFD, *Proceedings of the FLUENT Users' Group Meeting 2003*, Manchester, New Hampshire, 2003.

63. Pimenova, N. V., and T. R. Hanley: Effect of Corn Stover Concentration on Rheological Properties, *Appl. Biochem. & Biotech.*, **113/116**, 347-360(2004).

64. Houchin, T. L., and T. R. Hanley: Determination of the Rheology of Distillers' Grains Slurries Using a Helical Impeller Viscometer, *Appl. Biochem. & Biotech.*, **113/116**, 723-732(2004).

65. Wan, Y., and T. R. Hanley: CFD Simulation and Redesign of a Screw Conveyor Reactor, *Appl. Biochem. & Biotech.*, **113/116**, 733-746(2004).

66. Berson, R. E., J. S. Young, S. N. Kamer and T. R. Hanley: Detoxification of Actual Pretreated Corn Stover Hydrolysate Using Activated Carbon Powder, *Appl. Biochem. & Biotech.*, **124(1-3)**, 923-934(2005).

67. Berson, R. E., and T. R. Hanley: Use of Computational Fluid Dynamics Simulations for Design of a Pretreatment Screw Conveyor Reactor, *Appl. Biochem. & Biotech.*, **124(1-3)**, 935-946(2005).

68. Berson, R. E., and T. R. Hanley: Modeling a Horizontal Pretreatment Reactor Using Computational Fluid Dynamics, submitted for publication in *Appl. Biochem. & Biotech.*

69. Young, J. S., R. K. Dasari, R. E. Berson and T. R. Hanley: Multi-Step Detoxification of Pretreated Corn Stover Slurries, submitted for publication in *Appl. Biochem. & Biotech.*

Presentations

1. Hanley, T. R., and R. A. Mischke: A Mixing Model for a Continuous Flow Stirred Tank Reactor, *69th Annual AIChE Meeting*, Chicago, IL, 1976.

2. Hanley, T. R., T. E. Helminiak, and C. L. Benner: Extension of Aromatic Heterocyclic Polymers in Salt Solution, *28th Annual Southeast Regional ACS Meeting*, Gatlinburg, TN, 1976.

3. Hanley, T. R., T. E. Helminiak, and C. L. Benner: Shear Orientation of Aromatic Heterocyclic Polymers Expanded in Salt Solution, *28th Annual Southeast Regional ACS Meeting,* Gatlinburg, TN.

4. Invited Speaker (with N. L. Book): Anaerobic Digestion of Louisiana Substrates to Pipeline Quality Synthetic Natural Gas, *Evangeline Section of the Society of Petroleum Engineers/AIME*, Lafayette, LA, 1977.

5. Invited Speaker (with N. L. Book): Anaerobic Digestion of Louisiana Substrates to Pipeline Quality Synthetic Natural Gas, *Spindletop Section of the Society of Petroleum Engineers/AIME,* Lake Charles, LA, 1977.

6. Invited Speaker (with N. L. Book): Anaerobic Digestion of Louisiana Substrates to Pipeline Quality Synthetic Natural Gas, *Interdisciplinary Seminar Group, National Science and Technology Laboratories*, Bay St. Louis, MS, 1977.

7. Mallinson, R. G., and T. R. Hanley: The Application of Systems Analysis Techniques for the Evaluation of the Clinical Artificial Kidney, *30th Annual ACEMB Meeting*, Los Angeles, CA, 1977.

8. Hanley, T. R., and R. G. Mallinson: Hemodialyzer Modeling - The GPC as a Response Measurement Device, *1977 Int. Sym. Liq. Chrom. Analysis*, Chicago, IL, 1977.

9. Mallinson, R. G., and T. R. Hanley: The Residence Time Distribution Analysis of Clinical Artificial Kidneys, *Winter Annual ASME Meeting*, Atlanta, GA, 1977.

10. Hanley, T. R.: CSTR Mixing Models from Tracer Data, *Engineering Foundation Mixing Conference*, Rindge, NH, 1977.

11. Mallinson, R. G., and T. R. Hanley: Comparison of Clinical Artificial Kidneys by Means of Residence Time Distribution Analysis, *62nd FASEB Annual Meeting*, Atlantic City, NJ, 1978.

12. Telotte, J. C., and T. R. Hanley: Performance Prediction for Continuous Flow Stirred Tank Reactors, *71st Annual AIChE Meeting*, Miami, FL, 1978.

13. Telotte, J. C., and T. R. Hanley: Micromixing Effects in a Continuous Flow Stirred Tank Reactor, *Engineering Foundation Mixing Conference*, Henniker, NH, 1979.

14. Invited Speaker: Anaerobic Digestion of Biomass to Methane, *Terre Haute AIChE Local Section*, Terre Haute, IN, 1980.

15. Invited Speaker: Catalytic Conversion of Pyrolysis Gases to Liquid Fuels, *Solar Energy Research Institute*, Golden, CO, 1980.

16. Invited Speaker: Catalytic Conversion of Pyrolysis Gases to Liquid Fuels, *Terre Haute AIChE Local Section*, Terre Haute, IN, 1980.

17. Hanley, T. R., and M. N. McCall: A Kinetic Analysis for the Anaerobic Digestion of Water Hyacinth. *Third Symposium on Biotechnology in Energy Production and Conservation*, Gatlinburg, TN, 1981.

18. Hanley, T. R., and C. B. Benham: Catalytic Conversion of Solar Thermal Produced Pyrolysis Gases to Liquid Fuels, *Third Symposium on Biotechnology in Energy Production and Conservation*, Gatlinburg, TN, 198l.

19. Hanley, T. R., and M. L. Call: Prediction of Mixing Effects in Stirred Reactors for Non-Linear Competitive Reactions, *Engineering Foundation Mixing Conference*, Henniker, NH, 1981.

20. Hanley, T. R., and J. G. Hippler: Detection of Concentration Fluctuations in Moving Streams Circuitry and Probe Design, *Engineering Foundation Mixing Conference*, Henniker, NH, 198l.

21. LeBato, A. L., T. A. Armer and T. R. Hanley: Transmembrane Pressure Control in Hollow Fiber Kidneys, *34th Annual ACEMB Meeting*, Houston, TX, 1981.

22. Invited Speaker: Prediction of Mixing Effects in Stirred Reactors for Non-Linear Competitive Reactions, *Cleveland State University,* Cleveland, OH, 1981.

23. Invited Speaker: Catalytic Conversion of Biomass-Produced Pyrolysis Gases to Synthetic Fuels, *Case-Western Reserve University,* Cleveland, OH, 1981

24. Hanley, T. R., and M. L. Call: Mixing Effects on Product Distributions in Stirred Tank Reactors, *74th Annual AIChE Meeting*, New Orleans, LA, 1981.

25. Invited Speaker: Fuels and Chemicals Production Through Fischer-Tropsch Reaction of Pyrolysis Gases, *Tulane University*, New Orleans, LA, 1981.

26. Invited Speaker: Detection of Concentration Fluctuations in a Flowing Stream, *Chemineer, Inc.*, Dayton, OH, 1982.

27. Invited Speaker: Mixing Models for Determination of Reactor Performance, *University of Dayton*, Dayton, OH, 1982.

28. Invited Speaker: Mass Transfer Characterization in Hollow Fiber Kidneys, *University of Utah*, Salt Lake City, UT, 1982.

29. Invited Speaker: Characterization of Ultrafiltration Mass Transfer in Hollow Fiber Artificial Kidneys, *Washington University*, St. Louis, MO, 1982.

30. Invited Speaker: Characterization of Ultrafiltration Mass Transfer in Hollow Fiber Artificial Kidneys, *Ohio State University*, Columbus, OH, 1982.

31. Invited Speaker: The Influence of Concentration Fluctuations on Chemical Reactor Performance, *University of Missouri-Rolla*, Rolla, MO, 1982.

32. Armer, T. A., and T. R. Hanley: Mass Transfer Characterization in Hollow Fiber Kidneys, *First Southern Biomedical Engineering Conference*, Shreveport, LA, 1982.

33. Hippler, J. G., and T. R. Hanley: Detection of Concentration Fluctuations in a Moving Fluid Stream, *Indiana Academy of Science Fall Meeting*, Notre Dame, IN, 1982.

34. Hanley, T. R.: Liquid Fuel from Pyrolysis Gas at Low Hydrogen to Carbon Monoxide Ratios, *75th Annual AIChE Meeting*, Los Angeles, CA, 1982.

35. Akmal, K. A., T. R. Hanley, N. L. Book, and L. J. Groome: Pressure Retarded Osmosis as a Means of Waste Heat Recovery, *AIChE Spring National Meeting*, Houston, TX, 1983.

36. Hanley, T. R., and J. G. Hippler: Concentration Variance - A Measure of Reactor Segregation, *St. Louis AIChE Symposium '83*, St. Louis, MO, 1983.

37. Hippler, J. G. and T. R. Hanley: Concentration Fluctuations as a Measure of Reactor Segregation, *Engineering Foundation Mixing Conference*, Henniker, NH, 1983.

38. Hanley, T. R., and K. J. Liekhus: The Effects of Mixing on Continuous Michaelis-Menten Reactions, *1983 ISOTT Meeting*, Ruston, LA, 1983.

39. Hanley, T. R., and K. J. Liekhus: The Pyrolytic Conversion of Biomass to Fuels - A Review of the Reaction Engineering Applications, *76th Annual AIChE Meeting*, Washington, DC, 1983.

40. Invited Speaker: Some Common Misconceptions Concerning Energy and Environment, *Optimists Club*, Ruston, LA, 1984.

41. Invited Speaker: Pyrolysis of Biomass for the Production of Fuels and Chemicals, *University of Southwest Louisiana*, Lafayette, LA, 1984.

42. Hanley, T. R., and C. K. Svihla: Kinetics and Mixing Studies in a Mixed Flow Reactor, *92nd Annual ASEE Meeting*, Salt Lake City, UT, 1984.

43. Liekhus, K. J., and T. R. Hanley: Prediction of Oxygen Utilization in Brain Using Mixing Models, *Third Southern Biomedical Engineering* Conference, Birmingham, AL, 1984.

44. Invited Speaker: Experimental Determination of Micromixing in Continuous Flow Reactors, *Texas A&M University*, College Station, Texas, 1984.

45. McCarthy, D., C. Mart, and T. R. Hanley: Industrial Sponsorship of an Academic Practice School, *77th Annual AIChE Meeting*, San Francisco, CA, 1984.

46. Bruley, D. F., and T. R. Hanley: Development and Utilization of an Industrial Board of Advisors, *77th Annual AIChE Meeting*, San Francisco, CA, 1984.

47. Vahidi, B., D. H. Knoebel, J. B. Fernandes, and T. R. Hanley: Mechanistic Model for Ozone Absorption in Aqueous Solutions of Hydrogen Peroxide, *77th Annual AIChE Meeting*, San Francisco, CA, 1984.

48. Invited Speaker: Experimental Determination of Micromixing in Continuous Flow Reactors, *California Polytechnic State University*, San Luis Obispo, CA, 1984.

49. Invited Speaker: Experimental Determination of Micromixing in Continuous Flow Reactors, *University of Nevada-Reno*, Reno, NV, 1985.

50. Chiu, H. K., R. J. Urban, and T. R. Hanley: Phosphoric Acid Concentration by Electrodialysis, *AIChE Spring National Meeting*, Houston, TX, 1985.

51. Armer, T. A., and T. R. Hanley: Characterization of Mass Transfer in Hollow Fiber Artificial Kidney, 1*89th National ACS Meeting*, Miami Beach, FL, 1985.

52. Hanley, T. R.: Development and Utilization of an Industrial Board of Advisors, *93rd Annual ASEE Meeting*, Atlanta, GA, 1985.

53. Buerk, D. G., P. K. Nair, E. W. Bridges, and T. R. Hanley: Interpretation of Oxygen Disappearance Curves Measured in Blood Perfused Tissues, *1985 ISOTT Meeting*, Raleigh, NC, 1985.

54. Kufahl, R. H., T. R. Hanley, D. F. Bruley, and J. H. Halsey: A Multicomponent, Random Walk Model of Transport and Metabolism Inside a Neuron, *1985 ISOTT Meeting*, Raleigh, NC, 1985.

55. Liekhus, K. J., and T. R. Hanley: A Shrinking-Aggregate Two-Environment Mixing Model, *Engineering Foundation Mixing Conference*, Henniker, NH, 1985.

56. Svihla, C. K., and T. R. Hanley: The Use of the Frequency and Variance of the Signal from a Conductivity Probe to Determine Micromixing in a CSTR, *Engineering Foundation Mixing Conference*, Henniker, NH, 1985.

57. Ridgway, D., and T. R. Hanley: Evaluation of the Effect of System Parameters on Gas-Liquid Mass Transfer by Ozone Absorption, *Engineering Foundation Mixing Conference*, Henniker, NH, 1985.

58. Kufahl, R. H., and T. R. Hanley: A Multicomponent, Random Walk Model of Transport and Consumption in a Single Capillary Neuron System, *Fourth Southern Biomedical Engineering Conference*, Jackson, MS, 1985.

59. Hippler, J. G., C. K. Svihla, and T. R. Hanley: Micromixing Determination by RTD Concentration Fluctuation Measurement, *78th Annual AIChE Meeting*, Chicago, IL, 1985.

60. Invited Speaker: Experimental Determination of Micromixing in Continuous Reactors, Department of Chemistry, *Florida State University*, Tallahassee, FL, 1986.

61. Invited Speaker: A Future to Design: Prospects and Challenges: A Chemical Engineering Response, *FAMU/FSU College of Engineering*, Tallahassee, FL, 1986.

62. Hanley, T. R., D. Ridgway, C. K. Svihla, and L. C. Estabrook: Prediction of Cast Defects by Viscosity Analysis of a Molten Suspension, *4th International Symposium on Multiphase Transport and Particulate Phenomena*, Miami, FL, 1986.

63. Hanley, T. R., K. J. Liekhus, and L. C. Estabrook: Thermal Modeling of Slurry Solidification in Vertical Projectiles, *4th International Symposium on Multiphase Transport and Particulate Phenomena*, Miami, FL, 1986.

64. Hanley, T. R., and J. C. Telotte: Pesticide Rinse Water Recycling System, *AIChE Spring National Meeting*, Houston, TX, 1987.

65. Liekhus, K. J., and T. R. Hanley: Concentration Fluctuations as a Measure of Micromixing and the Effect of Chemical Reaction, *80th Annual AIChE Meeting*, New York, NY, 1987.

66. Ridgway, D., and T. R. Hanley: Simultaneous Measurement of k_{la} in a Gas-Liquid Stirred Tank, *80th Annual AIChE Meeting*, New York, NY, 1987.

67. Liekhus, K. J., and T. R. Hanley: Solvent Extraction from Spherical Particles in a Continuous Flow Evaporator, *80th Annual AIChE Meetin*g, New York, NY, 1987.

68. Mohan, R., T. R. Hanley, and R. N. Sharma: Suspension Characteristics of Particulate Solids in Stirred Tanks, *81st Annual AIChE Meeting*, Washington, D. C., 1988.

69. Liekhus, K. J., and T. R. Hanley: Solvent Extraction from Shrinking Polymeric Spheres in a Continuous Flow Evaporator - A Pilot-Plant Study, *Spring National AIChE Meeting*, Houston, TX, 1989.

70. Liekhus, K. J., and T. R. Hanley: Solvent Extraction from Shrinking Polymeric Spheres in a Continuous Flow Evaporator - A Supercomputer Simulation, *Spring National AIChE Meeting*, Houston, TX, 1989.

71. Ridgway, D., R. N. Sharma, and T. R. Hanley: An Instantaneous Reaction Model for Gas-Liquid Mass Transfer Studies, *Spring National AIChE Meeting*, Houston, TX, 1989.

72. Hanley, T. R., and D. Ridgway: Bioreactor Performance Improvement by Enhanced Gas-Liquid Mass Transfer, *Innovation '89*, Miami, FL, 1989.

73. Hanley, T. R.: Microelectronic Activities in the FAMU/FSU College of Engineering, *Florida Microelectronics Conference*, Boca Raton, FL, 1989.

74. Ridgway, D., R. N. Sharma, and T. R. Hanley: Power Draw in Agitated Gas-Liquid Tanks, *Engineering Foundation Mixing Conference*, Potosi, MO, 1989.

75. Ridgway, D., R. N. Sharma, and T. R. Hanley: Utilization of Instantaneous Reaction for Gas-Liquid Mass Transfer Studies, *Engineering Foundation Mixing Conference*, Potosi, MO, 1989.

76. Sharma, R. N., S. S. Peri, and T. R. Hanley: Solids Suspension in Stirred Tanks, *Engineering Foundation Mixing Conference*, Potosi, MO, 1989.

77. Chella, R., R. N. Sharma, and T. R. Hanley: Study of Impingement Mixing Using Laser Speckle Metrology, *Engineering Foundation Mixing Conference*, Potosi, MO, 1989.

78. Hanley, T. R., and K. J. Liekhus: Solvent Removal From Propellant Spheres in Continuous Evaporators, *American Defense Preparedness Association's Joint International Symposium on Compatibility of Plastics and Other Materials With Explosives, Propellants, and Pyrotechnics and Processing Propellants, Explosives, and Ingredients*, Virginia Beach, VA, 1989.

79. Svihla, C. K., and T. R. Hanley: Liquid-Phase Mixing Effects in the Continuous Cultivation of Baker's Yeast, *82nd Annual AIChE Meeting*, San Francisco, CA, 1989.

80. Invited Speaker: Gas-Liquid Mass Transfer in Stirred Tanks, *Tuskegee University*, Tuskegee, AL, 1990.

81. Liekhus, K. J., and T. R. Hanley: Supercomputer Simulation of Mass Transfer from Spheres in a Series of Continuous-Flow Stirred Vessels, *International Society for Mini and Microcomputers International Symposium*, New Orleans, LA, 1990.

82. Invited Speaker: Determination of Mass Transfer Coefficients in Agitated Gas-Liquid Reactors, *Union Carbide Chemicals and Plastics Company Technical Center*, South Charleston, WV, 1990.

83. Invited Speaker: Solvent Diffusion in Ball-Grain Powder Production, *Naval Ordnance Station*, Indian Head, MD, 1990.

84. Invited Speaker: Diffusion from Spheres in a Continuous-Flow Stirred Tank, *Westinghouse Savannah River Company*, Savannah River Laboratory, Aiken, SC, 1990.

85. Invited Speaker: Gas-Liquid Mass Transfer Characterization, *Procter and Gamble Company*, Cincinnati, OH, 1990.

86. Invited Speaker: Reactive Mixing in Microelectronics Processing, *Texas Instruments*, Dallas, TX, 1990.

87. Invited Speaker: Diffusion from Polymeric Spheres in a Continuous Flow Evaporator, *University of Florida*, Gainesville, FL, 1990.

88. Hanley, T. R.: Current Influences on the Chemical Engineering Curriculum - Liberal Studies, *83rd Annual AIChE Meeting*, Chicago, IL, 1990.

89. Hanley, T. R.: Microelectronic Materials, *83rd Annual AIChE Meeting*, Chicago, IL, 1990.

90. Sharma, R. N., S. S. Peri, and T. R. Hanley: Design Chart for Critical Impeller Speed for Solids Suspension in Stirred Vessels, *83rd Annual AIChE Meeting*, Chicago, IL, 1990.

91. Hanley, T. R., and K. J. Liekhus: Solvent Extraction from Nitrocellulose Grains in a Continuous Evaporator, Nitrocellulose and Nitrocellulose-Based Propellants: *Propellant Development and Characterization Subcommittee Workshop*, Wakulla Springs, FL, 1990.

92. Hanley, T. R., and K. J. Liekhus: Shaping and Dewatering of Nitrocellulose Grains in a Continuous Process, *American Defense Preparedness Association's Joint International Symposium on Compatibility of Plastics and Other Materials with Explosives, Propellants, and Pyrotechnics and Processing of Propellants, Explosives and Ingredient*s, San Diego, CA, 1991.

93. Hanley, T. R.: Establishing a Ph. D. Program in a State University, *99th Annual ASEE Meeting*, New Orleans, LA, 1991.

94. Invited Speaker: The Effect of the Economy on the Quantity and Quality of Engineering Graduates, *Eugene L. Grant Award Dinner, Engineering Economy Division of ASEE*, New Orleans, LA, 1991.

95. Svihla, C. K., and T. R. Hanley: Characterization of Oxygen Mass Transfer in Simulated Mycelial Broths, *Second Pan American Chemical Congress*, San Juan, Puerto Rico, 1991.

96. Invited Speaker: Gas-Liquid Mixing in Mycelial Reactors, *University of Kentucky*, Lexington, Kentucky, 1991.

97. Svihla, C. K., and T. R. Hanley: Characterization of Oxygen Mass Transfer in Filamentous Suspensions, *84th Annual AIChE Meeting*, Los Angeles, CA, 1991.

98. Invited Speaker: The Influence of the Economy of Chemical Engineering Graduates, *Dayton AIChE Local Section*, Dayton, Ohio, 1991.

99. Invited Speaker: The Direction for the Speed Scientific School in the 1990's, *Louisville Downtown Lions Club*, Louisville, Kentucky, 1991.

100. Invited Speaker: The Speed Scientific School: Direction for the 1990's, *Louisville Advanced Technology Council*, Louisville, Kentucky, 1991.

101. Invited Speaker: Enhancement of Gas-Liquid Mixing in Bioreactors, *Eli Lilly and Company*, Indianapolis, Indiana, 1992.

102. Invited Speaker: The Chemical Engineering Curriculum in 2001, *Indianapolis AIChE Local Section*, Indianapolis, Indiana, 1992.

103. Invited Speaker: Goals for Speed Scientific School in the 1990's, *Kiwanis Club of Louisville*, Louisville, Kentucky, 1992.

104. Invited Speaker: Food Engineering at Speed Scientific School - Plans for Development and Interaction, *Bluegrass Section of the Institute of Food Technology*, Louisville, Kentucky, 1992.

105. Invited Speaker: The Speed Scientific School: Direction for the 1990's, *Louisville IEEE Local Section*, Louisville, Kentucky, 1992.

106. Invited Speaker: The Speed Scientific School: Direction for the 1990's, *Louisville ASME Local Section*, Louisville, Kentucky, 1992.

107. Invited Speaker: Kentucky Perspective - Highlights of Activities and Potential for Activities at the University of Louisville, *Kentucky Science & Technology Council Conference on Biotechnology: Growing a New Kentucky Perspective*, Lexington, Kentucky, 1992.

108. Invited Speaker: Environmental Engineering in Speed Scientific School, *Institute for the Environment and Sustainable Development, University of Louisville*, Louisville, Kentucky, 1992.

109. Invited Speaker: The Speed Scientific School: Direction for the 1990's, *University of Louisville Philadelphia/Delaware Valley Alumni Association*, Wilmington, Delaware, 1992.

110. Svihla, C. K., D. A. Tinsley, and T. R. Hanley: Experimental Verification of the Use of Penetration Theory to Describe Reaction and Mass Transfer in Gas-Liquid Dispersions, *85th Annual AIChE Meeting*, Miami Beach, Florida, 1992.

111. Carrillo, R. E., C. K. Svihla, and T. R. Hanley: Rheological Characterization of Mycelial Broths, *85th Annual AIChE Meeting*, Miami Beach, Florida, 1992.

112. Tinsley, D. A., C. K. Svihla, and T. R. Hanley: Measurement of Gas-Phase Residence Time Distributions in Simulated Mycelial Broths, *85th Annual AIChE Meeting*, Miami Beach, Florida, 1992.

113. Sunderhaus, T. D., and T. R. Hanley: Kinetic Analysis of Warmed Over Flavor (WOF), *85th Annual AIChE Meeting*, Miami Beach, Florida, 1992.

114. Invited Speaker and Panel Member: Career Paths in Academia, *85th Annual AIChE Meeting*, Miami Beach, Florida, 1992.

115. Hanley, T. R.: The Master of Engineering Degree: The Engineering Professional Degree of the Future, *Frontiers in Education 1992*, Nashville, Tennessee, 1992.

116. Invited Speaker: The Influence of the Economy on Chemical Engineering Graduates, *Central Ohio AIChE Local Section*, Columbus, Ohio, 1993.

117. Invited Speaker: Mixing in Bioreactors, *Terre Haute AIChE Local Section*, Terre Haute, Indiana, 1993.

118. Invited Speaker: Gas-Liquid Mixing in Bioreactors, *University of Cincinnati*, Cincinnati, Ohio, 1993.

119. Invited Speaker: Industry-University Interactions in Engineering, *Winston-Salem Intercity Visit Team*, Louisville, Kentucky, 1993.

120. Svihla, C. K., and T. R. Hanley: Gas-Liquid Mass Transfer Characteristics of Filamentous Suspensions in Tall Tanks, *Engineering Foundation Mixing Conference*, Santa Barbara, California, 1993.

121. Invited Speaker: Reactive Mixing in Chemical and Biochemical Reactors, *Louisville AIChE Local Section*, Louisville, Kentucky, 1993.

122. Invited Speaker: Mixing in Mycelial Reactors, *Vanderbilt University*, Nashville, Tennessee, 1993.

123. Berson, R. E., C. K. Svihla, and T. R. Hanley: Gas-Liquid Mixing Characteristics of Filamentous Suspensions in Tall Tanks, *86th Annual AIChE Meeting*, St. Louis, Missouri, 1993.

124. Carrillo, R. E., C. K. Svihla, and T. R. Hanley: Measuring Yield Stress of Reconstituted Xanthan Gum Solutions, *86th Annual AIChE Meeting*, St. Louis, Missouri, 1993.

125. Invited Speaker: Engineering at the University of Louisville, *University of Louisville Metro New York Alumni Association*, New York, New York, 1993.

126. Invited Speaker: World-Class Engineering, *Louisville Chapter of the Kentucky Society of Professional Engineers*, Louisville, Kentucky, 1994.

127. Hanley, T. R.: Bonding with Corporate Partners - The Rapid Prototyping Facility, *Partnerships: Marshaling Resources for Engineering Education and Research*, Boulder, Colorado, 1994.

128. Dronawat, S. N., C. K. Svihla, and T. R. Hanley: The Effects of Agitation and Aeration Upon the Production of Gluconic Acid by Aspergillus Niger, *16th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 1994.

129. Dronawat, S. N., C. K. Svihla, and T. R. Hanley: Measurement of the Rheology of Mycelial Broths, *16th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 1994.

130. Svihla, C. K., R. E. Berson, and T. R. Hanley: Modeling Mass Transfer and Gas Phase Mixing in the Reactive Absorption of Ozone, *8th European Mixing Conference*, Cambridge, United Kingdom, 1994.

131. Choudhary, S., J. T. Hale, C. K. Svihla, and T. R. Hanley: Analysis of Impingement Mixing in the Production of Polyurethane Foams, *13th International Symposium of Chemical Reaction Engineering*, Baltimore, Maryland, 1994.

132. Rister, J. E., S. N. Dronawat, and T. R. Hanley: Effects of pH and Substrate concentration on Growth Kinetics of *Aspergillus niger* and Production of Gluconic Acid, *87th Annual AIChE Meeting*, San Francisco, California, 1994.

133. Berson, R. E., C. K. Svihla, and T. R. Hanley: Gas-Liquid Mixing and Mass Transfer in Tall Tanks, *87th Annual AIChE Meeting*, San Francisco, California, 1994.

134. Invited Speaker: Mixing in Bioreactors, *Department of Biochemistry, University of Louisville*, Louisville, Kentucky, 1995.

135. Invited Speaker: Cooperative Education at the Speed Scientific School, *Louisville Chapter of the Society of American Military Engineers*, Louisville, Kentucky, 1995.

136. Panel Member. Dialogue with the Deans, *4th Engineering Deans and Development Directors Conference*, Seattle, Washington, 1995.

137. Dronawat, S. N., C. K. Svihla, and T. R. Hanley: Development of Impeller Prototypes by Selective Laser Sintering Technology, *15th Biennial North American Mixing Conference*, Banff, Alberta, Canada, 1995.

138. Choudhary, S., C. K. Svihla, and T. R. Hanley: Computational Fluid Dynamics Simulation of Impingement Mixing, *15th Biennial North American Mixing Conference*, Banff, Alberta, Canada, 1995.

139. Dronawat, S. N., J. A. Donnelly, C. K. Svihla, and T. R. Hanley: Steady Shear Characteristics of Cellulose Fiber Suspensions and Filamentous Fermentation Broths, *15th Biennial North American Mixing Conference*, Banff, Alberta, Canada, 1995.

140. Invited Speaker: Speed Scientific School: Outlook for 1995-96, *Kiwanis Club of Metropolitan Louisville*, Louisville, Kentucky, 1995.

141. Huang, F., C. K. Svihla, and T. R. Hanley: Simulation of the Flow Pattern in an Agitated Tank with Multiple Rushton Turbines by Using FLUENT, *FLUENT User's Group Meeting*, Hanover, New Hampshire, 1995.

142. Invited Speaker: Higher Education and Small Business Collaboration, *Kentucky Small Business Research Grant Conference*, Louisville, Kentucky, 1995.

143. Shafie, M., S. N. Dronawat, C. K. Svihla, and T. R. Hanley: The Effect of Agitation on the Enzymatic Hydrolysis of Cellulose, *88th Annual AIChE Meeting*, Miami Beach, Florida, 1995.

144. Dronawat, S. N., C. K. Svihla, and T. R. Hanley: Optimization of Oxygen Transfer in Mycelial Fermentation using Different Combinations of Impellers, *88th Annual AIChE Meeting*, Miami Beach, Florida, 1995.

145. Invited Speaker: Gas-Liquid Mixing Characteristics of Cellulose Fiber Suspensions and Filamentous Fermentation Broths, *Toyohashi University of Technology*, Toyohashi, Japan, 1995.

146. Hanley, T. R.: Best Practices in Partnering for Researching New Technology, *ASEE College Industry Education Conference*, San Jose, California, 1996.

147. Invited Speaker: Innovative Interactions for Developing New Technology, *Louisville Chapter of the Kentucky Society of Professional Engineers*, Louisville, Kentucky, 1996.

148. Dronawat, S. N., C. K. Svihla and T. R. Hanley: Effect of Impeller Geometry on Gas-Liquid Mass Transfer Coefficient in Filamentous Suspensions, *18th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 1996.

149. Rieth, T. C., J. A. Donnelly, S. N. Dronawat, C. K. Svihla and T. R. Hanley: Steady Shear Characteristics of Filamentous Suspensions using, Rushton Turbine, Vane Impeller and Helical Ribbon Impeller, *18th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 1996.

150. Svihla, C. K., R. E. Berson, S. N. Dronawat and T. R. Hanley, Liquid Mixing and Oxygen Transfer in a Novel Continuous Roller Bottle Reactor, *5th World Congress of Chemical Engineering*, San Diego, California, 1996.

151. Dronawat, S. N., T. C. Rieth, C. K. Svihla and T. R. Hanley, Use of a Helical Impeller to Determine Steady Shear Characteristics of Filamentous Suspensions, *5th World Congress of Chemical Engineering*, San Diego, California, 1996.

152. Shafie, M., S. N. Dronawat, C. K. Svihla, and T. R. Hanley: The Contribution of Various Impeller Designs to the Effect of Agitation on the Enzymatic Hydrolysis of Cellulose, *89th Annual AIChE Meeting*, Chicago, Illinois, 1996.

153. Invited Speaker: Impact of Speed Scientific School on the Economic Development of the Louisville Area, *Louisville Chapter of the Kentucky Society of Professional Engineers,* Louisville, Kentucky, 1997.

154. Invited Speaker: Industry/University Collaboration with Mutual Benefit, South Jersey *AIChE Local Section and South Jersey ACS Local Section*, Thorofare, New Jersey, 1997.

155. Invited Speaker: The Influence of the Economy on Chemical Engineering Graduates, *Western South Carolina AIChE Local Section*, Greenville, South Carolina, 1997.

156. Invited Speaker: The Influence of the Economy on Chemical Engineering Graduates, *Knoxville-Oak Ridge AIChE Local Section*, Knoxville, Tennessee, 1997.

157. Berson, R. E., T. V. Mane, C. K. Svihla and T. R. Hanley: Improved Oxygen Delivery in a Continuous Roller Bottle Reactor, *19th Symposium on Biotechnology for Fuels and Chemicals*, Colorado Springs, Colorado, 1997.

158. Shafie, M., C. K. Svihla and T. R. Hanley: Evaluation of the Power Consumption in the Enzymatic Hydrolysis of Cellulose, *19th Symposium on Biotechnology for Fuels and Chemicals*, Colorado Springs, Colorado, 1997.

159. Invited Speaker: Industry/University Collaboration with Mutual Benefit, *Distillers Grains Technology Council Symposium*, Louisville, Kentucky, 1997.

160. Huang, F., S. N. Dronawat, C. K. Svihla, and T. R. Hanley: Simulation of Flow in Helical Ducts Using FLUENT, *16th Biennial North American Mixing Conference*, Williamsburg, Virginia, 1997.

161. Huang, F., and T. R. Hanley: CFD Simulation of Flow Patterns and Turbulence Dissipation Rates in an Opposed Jet Mixing Head, *16th Biennial North American Mixing Conference*, Williamsburg, Virginia, 1997.

162. Berson, R. E., T. V. Mane, C. K. Svihla, and T. R. Hanley: Improved Mixing and Oxygen Delivery in a Novel Continuous Roller Bottle Reactor, *16th Biennial North American Mixing Conference*, Williamsburg, Virginia, 1997.

163. Svihla, C. K., W. Ibrahim, R. E. Berson, and T. R. Hanley: Impeller Power Draw and Hydrodynamic Studies in an Agitated, Steam-Sparged, Shallow-Dished Bottom Vessel, *16th Biennial North American Mixing Conference*, Williamsburg, Virginia, 1997.

164. Walsh, K. M., T. R. Hanley, W. K. Pitts, D. Hensel, J. Hernandez, M. Crain, and J. Cole: Microfabrication Activities at the University of Louisville, *Twelfth Biennial University/Government/Industry Microelectronics Symposium*, Rochester, New York, 1997.

165. Invited Speaker: Accredited Engineering Programs at the University of Louisville, *V Pan-American Workshop of Evaluation and Accreditation Programs of Engineering - UPADI 97*, San Salvador, El Salvador, 1997.

166. Huang, F., C. K. Svihla, T. R. Hanley, and J. Zhao: CFD Simulation and Validation of Rotor-Stator Mixing Performance, *90th Annual AIChE Meeting*, Los Angeles, California, 1997.

167. Berson, R. E., W. J. Pieczynski, C. K. Svihla, R. M. Dedolph, and T. R. Hanley: Cell Cultures in a Novel Continuous Perfusion Roller Bottle Reactor, *90th Annual AIChE Meeting*, Los Angeles, California, 1997.

168. Invited Speaker: The Challenge for Excellence and Speed Scientific School, *University of Louisville Philadelphia/Delaware Valley Alumni Association*, Mendenhall, Pennsylvania, 1997.

169. Invited Speaker: Challenge for Excellence - 1997-2008: The Speed Scientific School Investment, *Louisville Chapter of the Kentucky Society of Professional Engineers*, Louisville, Kentucky, 1998.

170. Invited Speaker: Challenge for Excellence - 1997-2008: The Speed Scientific School Investment, *The Hardin County Plant Managers' Association*, Elizabethtown, Kentucky, 1998.

171. Invited Speaker: Challenge for Excellence - 1997-2008: The Speed Scientific School Investment in Bioengineering, *University of Louisville Department of Surgery Grand Rounds*, Louisville, Kentucky, 1998.

172. Pastorino, S. A., W. T. Effler, and T. R. Hanley: Purification Optimization for the Recovery of Phenyl Ethyl Alcohol, *20th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 1998.

173. Svihla, S. P., C. K. Svihla, and T. R. Hanley: Simulation of Mixing in Biological Reactors Using Computational Fluid Dynamics, *20th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 1998.

174. Invited Speaker: The Influence of the Economy on Chemical Engineering Graduates, *Cincinnati AIChE Local Section*, Cincinnati, Ohio, 1998.

175. Friederichs, G., U. Baurmeister, H.-D. Papenfuss, G. Harding, E. Klein, and T. R. Hanley: Removal of Heparin from Whole Blood Using an Affinity Adsorption Hollow Fiber Membrane, *Ninth Annual Meeting of the North American Membrane* Society, Cleveland, Ohio, 1998.

176. Berson, R. E., W. J. Pieczynski, C. K. Svihla and T. R. Hanley: Liquid Mixing, Oxygen Transfer, and Cell Cultures in a Novel Continuous Perfusion Roller Bottle Reactor, *1998 Regional Chemical Engineering Graduate Student Symposium*, Lexington, Kentucky, 1998.

177. Friederichs, G., U. Baurmeister, H-D. Papenfuss, G. Harding, E. Klein and T. R. Hanley: Fluid Dynamics in an Affinity Adsorption Hollow Fiber Membrane Module for the Removal of Heparin from Whole Blood, *1998 Regional Chemical Engineering Graduate Student Symposium, Lexington*,

Kentucky, 1998.

178. Pastorino, S. A., W. T. Effler and T. R. Hanley: Separation Optimization for the Recovery of Phenyl Ethyl Alcohol, *1998 Regional Chemical Engineering Graduate Student Symposium*, Lexington, Kentucky, 1998.

179. Svihla, S. P., C. K. Svihla, and T. R. Hanley: Simulation of the Flow Pattern in a 500 Gallon Liquid-Liquid Contactor, *1998 Regional Chemical Engineering Graduate Student Symposium*, Lexington, Kentucky, 1998.

180. Shafie, M., and T. R. Hanley: Factors Contributing to Left Ventricular Diastolic Function, *1998 Regional Chemical Engineering Graduate Student Symposium*, Lexington, Kentucky, 1998.

181. Invited Speaker: Challenge for Excellence - 1997-2008: An Update on the Speed Scientific School Investment, *Greater Louisville Inc., Environmental Affairs Committee*, Louisville, Kentucky, 1998.

182. Shafie, M., S. C. Koenig, and T. R. Hanley: Computational Fluid Dynamics of Left Ventricular Filling, *91st Annual AIChE Meeting*, Miami Beach, Florida, 1998.

183. Friederichs, G., U. Baurmeister, H.-D. Papenfuss, G. Harding, E. Klein, and T. R. Hanley: Fluid Dynamics in an Affinity Adsorption Hollow Fiber Membrane for Removal of Heparin from Whole Blood Using, *91st Annual AIChE Meeting*, Miami Beach, Florida, 1998.

184. Berson, R. E., W. J. Pieczynski, C. K. Svihla, and T. R. Hanley: Monoclonal Antibody Production in a Novel Continuous Perfusion Roller Bottle Reactor, *91st Annual AIChE Meeting*, Miami Beach, Florida, 1998.

185. Invited Speaker: Challenge for Excellence - 1997-2008: An Update on the Speed Scientific School Investment, *Louisville ASHRAE Chapter Meeting*, Louisville, Kentucky, 1999.

186. Invited Speaker: The Influence of the Economy on Chemical Engineering Graduates, *Wilmington AIChE Local Section*, Newark, Delaware, 1999.

187. Friederichs, G., U. Baurmeister, H.-D. Papenfuss, G. Harding, E. Klein, and T. R. Hanley: Heparin Removal from Whole Blood Using Affinity Adsorption, *1999 International Congress on Membranes and Membrane Processes*, Toronto, Canada, 1999.

188. Walsh, K. M., T. R. Hanley, W. K. Pitts, M. Crain, J. Cole, C. Foreman, D. Hensel, and J. Hernandez: The Development of a New Microfabrication/MEMS Course at the University of Louisville, *Thirteenth Biennial University/Government/Industry Microelectronics Symposium*, Minneapolis, Minnesota, 1999.

189. Svihla, S. P., C. K. Svihla, and T. R. Hanley: Simulation of Low-Power Agitation Systems for Large-Scale Biomass Conversion Reactors, *Fourth Biomass Conference of the Americas*, Oakland, California, 1999.

190. Invited Speaker: Mixing in Bioreactors, *Vanderbilt University*, Nashville, Tennessee, 2000.

191. Friederichs, G., T. R. Hanley, E. Klein, and U. Baurmeister: Design of an Affinity Adsorption Membrane Module for Heparin Removal, *Eleventh Annual Meeting of the North American Membrane* Society, Boulder, Colorado, 2000.

192. Svihla, C. K., S. P. Svihla, and T. R. Hanley: Simulation of Flow in Single and Multiple Impeller Vessels, *FLUENT Users' Group Meeting 2000*, Danvers, Massachusetts, 2000.

193. Priddy, S. A., and T. R. Hanley: Effect of Agitation on Removal of Acetic Acid from Pretreated Hydrolysate, *23rd Symposium on Biotechnology for Fuels and Chemicals*, Breckenridge, Colorado, 2001.

194. Hanley, T. R.: The Masters Degree as the Professional Entry-Level Degree in Chemical Engineering, 2001 *ASEE Annual Conference & Exposition*, Albuquerque, New Mexico, 2001.

195. Svihla, S. P., and T. R. Hanley: Design of Agitation Systems for Large-Scale Bioreactors Using Computational Fluid Dynamics, *MIXING XVIII*, Pocono Manor, Pennsylvania, 2001.

196. Shafie, M., S. Thomas, P. J. Bates, D. M. Miller and T. R. Hanley: Characterization of Suspension Cultures of DU145 Human Prostrate Cancer Cells, *Research! Louisville*, Louisville, Kentucky, 2001.

197. Hanley, T. R.: Challenge for Excellence 1997-2008 - Speed Scientific School Investment in Bioengineering, *Research! Louisville*, Louisville, Kentucky, 2001.

198. Hanley, T. R., G. Friederichs, E. Klein, and U. Baurmeister: Multidisciplinary Collaborations: Direct Removal of Heparin from Whole Blood Using Affinity Adsorption Hollow Fiber Membranes, *Research! Louisville*, Louisville, Kentucky, 2001.

199. Hanley, T. R., M. Shafie, S. Thomas, P. J. Bates, D. M. Miller and T. R. Hanley: Multidisciplinary Collaborations: Characterization of Suspension Cultures of DU145 Human Prostrate Cancer Cells, *Research! Louisville*, Louisville, Kentucky, 2001.

200. Priddy, S. A., and T. R. Hanley: Effect of Acetic Acid on Removal of Acetic Acid From Pretreated Hydrolysate, *94th Annual AIChE Meeting*, Reno, Nevada, 2001.

201. Hanley, T. R.: Handling Faculty Conflict, *94th Annual AIChE Meeting*, Reno, Nevada, 2001.

202. Shafie, M., S. Thomas, P. J. Bates, D. M. Miller and T. R. Hanley: Characterization of Suspension Cultures of DU145 Human Prostrate Cancer Cells, *94th Annual AIChE Meeting*, Reno, Nevada, 2001.

203. Invited Speaker: Opportunities for Collaboration In Bioengineering, *Louisville Medical Center Development Corporation Seminar*, Louisville, Kentucky 2002.

204. Priddy, S. A., and T. R. Hanley: Effect of Agitation on Removal of Acetic Acid From Pretreated Hydrolysate by Activated Carbon, *24th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 2002.

205. Pimenova, N. V., and T. R. Hanley: Measurement of Rheological Properties of Corn Stover Suspensions, *24th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 2002.

206. Wan, Y., and T. R. Hanley: Flow Field in Shrinking-Bed Reactor for Pretreatment of Cellulosic Biomass, *24th Symposium on Biotechnology for Fuels and Chemicals*, Gatlinburg, Tennessee, 2002.

207. Wan Y., and T. R. Hanley: CFD Simulation and Comparison of Bioreactors for Bioethanol Production, *FLUENT Users' Group Meeting 2002*, Nashua, New Hampshire, 2002.

208. Hanley, T. R.: Bioengineering Program - Speed Scientific School, *Research! Louisville*, Louisville, Kentucky, 2002.

209. Hanley, T. R.: Speeding into the Future: Innovative Technology at Speed School, *Technology Network of Louisville (TeN)*, Louisville, Kentucky, 2003.

210. Houchin, T. L., and T. R. Hanley: Determination of the Rheological Properties of Distillers' Grains Slurries Using a Helical Impeller Viscometer, *25th Symposium on Biotechnology for Fuels and Chemicals*, Breckenridge, Colorado, 2003.

211. Um, B.-Y., and T. R. Hanley: The Effect of Toxic Products on Ethanol Production from Concentrated Corn Stover Hydrolysates in a Three-Liter Bench Scale Bioreactor, *25th Symposium on Biotechnology for Fuels and Chemicals*, Breckenridge, Colorado, 2003.

212. Pimenova, N. V. B.-Y. Um, and T. R. Hanley: The Effect of Viscosity Change on the Rate and Extent of *Zymomonas mobilis* Cellulose Fermentation, *25th Symposium on Biotechnology for Fuels and Chemicals*, Breckenridge, Colorado, 2003.

213. Wan, Y., and T. R. Hanley: CFD Simulation and Redesign of a Vertical Screw Conveyor Reactor, *25th Symposium on Biotechnology for Fuels and Chemicals*, Breckenridge, Colorado, 2003.

214. Wan, Y., and T. R. Hanley: Redesign of a Vertical Screw Conveyor Reactor Based on CFD, *FLUENT Users' Group Meeting 2003*, Manchester, New Hampshire, 2003.

215. Hanley, T. R.: Innovative Degree Programs and Research at Speed School, *Kentuckiana Post of the Society of American Military Engineers*, Louisville, Kentucky, 2003

216. Priddy, S. A., C. K. Svihla, R. E. Berson, M. Shafie, G. Friederichs, S. P. Svihla, and T. R. Hanley: Development and Testing of a Liquid-Liquid Noncoalescing System in Agitated Vessels, *Mixing XIX*, Lake Placid, New York, 2003.

217. Wan, Y., M. Shafie and T. R. Hanley: Oxygen Transfer and Fluid Flow Simulations of a Spinner Flask Bioreactor, *Mixing XIX*, Lake Placid, New York, 2003.

218. Pimenova, N. V., and T. R. Hanley: Rheological Property Determination of Corn Stover Suspensions Using a Helical Impeller, *Mixing XIX*, Lake Placid, New York, 2003.

219. Hanley, T. R., R. E. Berson, G. Friederichs, S. A. Priddy, M. Shafie, C. K. Svihla, and S. P. Svihla: Development and Testing of a Liquid-Liquid Noncoalescing System in Static Mixers, *Mixing XIX*, Lake Placid, New York, 2003.

220. Svihla, S. P., and T. R. Hanley: Simulation of Flow in a Propeller Stirred Vessel based on the Actual Impeller Geometry, *96th Annual AIChE Meeting*, San Francisco, California, 2003.

221. Hanley, T. R.: Auburn Academics – Impact on Alabama, *Opelika Rotary Club*, Auburn, Alabama, 2004.

222. Berson, R. E., and T. R. Hanley: The Use of CFD Simulations for the Design of a Pretreatment Screw Conveyor Reactor, *26th Symposium on Biotechnology for Fuels and Chemicals*, Chattanooga, Tennessee, 2004.

223. Berson, R. E., J. S. Young, S. N. Kamer and T. R. Hanley: Detoxification of Corn Stover Hydrolysate Using an Activated Carbon Powder, *26th Symposium on Biotechnology for Fuels and Chemicals*, Chattanooga, Tennessee, 2004.

224. Hanley, T. R.: An Update on Auburn, *Bluegrass Auburn Club*, Lexington, Kentucky, 2004.

225. Berson, R. E., and T. R. Hanley: Modeling a Horizontal Pretreatment Reactor Using Computational Fluid Dynamics, *27th Symposium on Biotechnology for Fuels and Chemicals*, Denver, Colorado, 2005.

226. Young, J. S., R. K. Dasari, R. E. Berson and T. R. Hanley: Multi-Step Detoxification of Pretreated Corn Stover Slurries, *27th Symposium on Biotechnology for Fuels and Chemicals*, Denver, Colorado, 2005.

227. Berson, R. E., B. M. Buckman, E. G. Brehob, and T. R. Hanley: The Use of Enzymes to Determine Mixing Efficiency in a Viscous Slurry, *Mixing XX*, Parksville, British Columbia, 2005.

Courses Taught

Introduction to Chemical Engineering - no text (1)
Introduction to Engineering - Beakley, Evans, and Keats; Red (1)
Material and Energy Balances - Felder and Rousseau (2)
Introduction to Transport Phenomena - Fahien (2)
Thermodynamics I - Van Wylen and Sonntag; Smith and Van Ness (2,3)
Thermodynamics II - Smith and Van Ness; Prausnitz (3)
Chemical Kinetics -Wojciekowski; Smith; Levenspiel (3)
Physical Chemistry -Moore; Adamson; Daniels and Alberty (3)
Unit Operations - Bennett and Myers; McCabe and Smith (3)
Principles of Engineering Economics - Jelen and Black (3)
Unit Operations Laboratory - personal notes (3,4)
Microelectronic Materials -personal notes (3,4)
Practice School - personal notes (4)
Reactor Design -Fogler; Levenspiel (3,4)
Plant Design and Economics - Peters and Timmerhaus; Jelen (4)
Transport Phenomena - Fahien (4)
Polymers Engineering - Rodriguez, Billmeyer (4,G)
Biochemical Engineering - Bailey and Ollis (4,G)
Industrial Mixing - Oldshue; Nagata; Uhl and Gray (4,G)
Corrosion Engineering - personal notes; Fontana and Greene (4,G)
Advanced Thermodynamics - Modell and Reid; Prausnitz (G)
Advanced Reactor Design - Levenspiel; Carberry (G)
Polymer Processing - McKelvy; Middleman (G)
Mass Transport Phenomena - Bird, Stewart, and Lightfoot (G)
Advanced Engineering Mathematics - Jenson and Jeffreys; Wylie (G)
Process Dynamics - Luyben (G)
Computational Fluid Dynamics (G)

Engineering Economic Analysis - Sullivan, Bontadelli, and Wicks (G)

Board Positions and Current Consulting

2006-Present. Board of Directors. American Institute of Chemical Engineers, New York, New York.

2005-Present. Chemical Engineering Consultant. Analysis of Fluid Flow in the Oster Blender Using CFD Analysis, Sunbeam Products, Boca Raton, Florida.

2005-Present. Interim Chief Technical Officer, Immediate Response Spill Technologies, LLC, Louisville, Kentucky.

2004-Present. Bioengineering Consultant. Computational Fluid Dynamics (CFD) Design Development of a Pediatric Assist Device, University of Louisville/Ension Corporation, Louisville, Kentucky.

2000-Present. College of Engineering Industrial Advisory Board, Michigan Technological University, Houghton, Michigan.

1999-Present. College of Engineering Committee of 100, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

1997-Present. Board of Directors. Plasticolors, Inc., Ashtabula, Ohio

2002-2003. Board of Advisors. Center for Research in Mathematics and Science Teacher Development, University of Louisville, Louisville, Kentucky.

2000-2003. Board of Directors. Innovative Productivity, Inc., Louisville, Kentucky.

1997-2003. Board of Directors. Louisville/Jefferson County Redevelopment Authority, Louisville, Kentucky

1996-2003. Councilor for the University of Louisville, Oak Ridge Associated Universities, Oak Ridge, Tennessee (Nomination Committee - 1999-2001)

1994-2003. Board of Directors. Kentucky Partners Pollution Prevention Center, Louisville, Kentucky

1991-2003. Board Member. Kentucky State Board of Registration for Professional Engineers and Land Surveyors, Frankfort, Kentucky

2002. Panel Review of Chemical Engineering Bio Initiative at Montana State University, American Association for the Advancement of Science, Washington, District of Columbia.

1993-1998. Board of Directors. Louisville Science Center, Louisville, Kentucky

1996. Board of Directors. The Louisville Area Chamber of Commerce, Louisville, Kentucky

1992-1996. Board of Directors. Louisville Advanced Technology Council, Louisville, Kentucky (President, 1996)

1992-1993. External Integrated Resource Planning Advisory Panel. Louisville Gas and Electric Company, Louisville, Kentucky

1989-1992. Divisional Advisor. Biological and Critical Systems Division, National Science Foundation, Washington, District of Columbia

1987-1989. Divisional Advisor. Chemical, Biochemical, and Thermal Division, National Science Foundation, Washington, District of Columbia

Honors, Awards & Listings

Phi Kappa Phi, 1967
Tau Beta Pi, 1967
Phi Lambda Upsilon, 1967
Distinguished Military Graduate, 1967
Society of American Military Engineers Award, 1966 and 1967
American Legion Academic Award, 1967
Omega Chi Epsilon, 1977
Outstanding AIChE Student Chapter Advisor, 1979
Who's Who in Engineering, 1980
Who's Who in the South and Southwest, 1980
AIChE Professional Development Recognition Certificate, 1980
Order of the Engineer, 1980
Outstanding Young Men of America, 1981
Who's Who in the Midwest, 1982
SAE Ralph R. Teetor Educational Award, 1989
Who's Who in America, 1989
American Men and Women of Science, 1992
International Directory of Distinguished Leadership, 1992
Who's Who in Science and Engineering, 1993
Who's Who in American Education, 1993
KSPE Outstanding Engineer in Education Award, 1994
Who's Who in the World, 1995
Who's Who Worldwide, 1995
AIChE Fellow, 1995
ASEE/CIEC College Industry Partnership Division Best Presentation Award, 1996

Professional Societies

American Institute of Chemical Engineers
- Board of Directors, 2006-2008.
- AIChE Foundation
  - Trustee, 1990-
  - Past Chair, 2002-2004; Chair, 2000-2002; Vice-Chair, 1998-2000
- Career and Education Operating Council, 2000-2003
- Industrial Advisory Board, 2001-
- Visitor for ABET Accreditation, 2000-
- AIChE Speakers' Bureau, 1991-1997
- Nominating Committee, 1994-1995

Meeting Program Chair for 1988 New Orleans Meeting
General Arrangements Chair for 1986 Miami Beach Meeting
Student Chapters Committee
Chair, 1990; First Vice-Chair, 1989; Second Vice-Chair, 1988;
Chair, Awards Committee, 1984-1987
Kinetics, Catalysis, and Reactor Engineering (Area 1B)
Session Chair - 1982, 1984, 1985, 1986, 1987, 1989
Mixing (Area 3A)
Programming Committee Vice-Chair, 1989-1992; Session Chair - 1987
North American Mixing Forum
Management Division
Past Chair, 1994; Chair, 1993; First Vice-Chair, 1992; Second Vice-Chair,
1991; Secretary, 1987-90; Newsletter Editor, 1992-93; Chair, R&D
Management (Area 5a), 1983-91; Session Chair - 1984, 1990
Food, Pharmaceutical & Bioengineering Division
Newsletter Editor, 1992-94
Environmental Division
Session Chair (Area 9c) - 1990
Tallahassee Local Section Chair, 1988-89 and 1989-90
Terre Haute Local Section Chair, 1981-82 and 1982-83
New Orleans Local Section Chair, 1978-79
Tulane University Student Chapter Advisor, 1976-79
American Society of Engineering Education
Engineering Deans Council, 1991-
Public Policy Committee, 1994-
Army Research Office Liaison, 1994-97
ChE Division
Director, 1992-94; Chair, 1990-91; Chair-Elect, 1989-90;
Program Chair for Reno Annual Meeting, 1986
Tulane Campus Activity Coordinator, 1977-79
American Society for Mechanical Engineers, 1991-96
Bioprocess Engineering Subdivision Advisory Council, 1992-95
Council for Chemical Research, 1991-2003
Kentucky Society of Professional Engineers, 1991-2003
Engineering Education Committee, 1992-2003
Honorary Chair, MATHCOUNTS Program, 1992-2003
Legislative Committee, 1998-2003
Leadership Louisville
Graduate, 1993
Education Day Chair, 1995
Leadership Kentucky
Class of 1995
National Association of Basketball Coaches
National Association of State Universities and Land-Grant Colleges
Academic Affairs Committee, 2004-
Commission on Outreach and Technology Transfer, 1992-2000
Commission on Food, Environment & Renewable Resources, 2000-2003
National Council of Examiners for Engineering and Surveying
Education Assessment and Qualifications Committee, 1991-93, 1997-98
Examination Policy and Procedures Committee, 1993-97
Omega Chi Epsilon

Tulane Student Chapter Advisor, 1977-79
Louisiana Tech Student Chapter Advisor, 1983-85
Professional Engineer - Kentucky
Sigma Xi