Thanks for the Memories…

By Wendy A. Rogers, HFES President

By the time you read this, I will be nearing the end of my term as president of HFES. We will be in the process of transitioning the reins into the able hands of Marvin J. Dainoff, who has worked extremely hard this year in preparation for his presidential year. I am confident that he will do an excellent job.

I have enjoyed my year. As many of you know, I traveled a great deal. I joked that I was on the “Wendy World Tour” — I should have had T-shirts printed up! Thanks to the kind invitations from student chapters and local chapters, I had the good fortune to meet many of our Society members. I was very impressed by the high-quality human factors research and practice that our members engage in. I was also struck by the high quality of our future members. The Society will be in good hands if today’s student members remain actively involved — they are an impressive group.

As I have stated in all of the Bulletin articles I have written this year, I continue to be impressed by the activities of our volunteers. Let me just highlight some of the exciting things the Society has been involved in this year:

Our new and improved Web site. Thanks to the hard work of our Web Design Advisory Task Force (chaired by Anna M. Wichansky) and the HFES staff members, our revised Web site is online and getting good reviews. We recognize that Web sites must evolve and continue to be improved, and we welcome your comments and suggestions. (You may provide comments online at hfes.org.)

Outreach to the public. We have a newly formed Media Relations Committee chaired by Tony Brown, which has been actively involved in an initiative called Discoveries and Breakthroughs Inside Science (DBIS). This effort is designed to develop stories for local news stations about exciting activities in the field of human factors and ergonomics. We have the potential to reach millions of people through this avenue. DBIS has already produced two of the story ideas we submitted, and more are on the way. Our thanks to those members who have submitted ideas.

Education resources for our members. The Education and Training Committee chaired by Patricia R. Delucia is involved in the Educational Resource Project wherein the committee plans to develop a collection of resources that members can use to educate themselves and train others in the field of human factors and ergonomics. They have also promoted two workshops on usability at this year’s meeting as a result of a survey they conducted in which members identified this topic as a need for more education and training.

Advocacy to government decision makers and members of Congress. In conjunction with the Federation of Behavioral, Psychological, and Cognitive Sciences, we convened a very successful Science Forum on Human Factors and Patient Safety last October in Washington, D.C. http://www.thefederationonline.org/PatientSafetyIndex.html. Plans are under way for a Science Forum on Human Factors and Homeland Security for November 2005. (You can read more about this year’s event on page 2.) These forums provide the opportunity for researchers and practitioners to communicate with government agencies and to meet with members of Congress and their staffs before and after the forum. We plan to conduct a forum every year on a different topic and to institute an Advocacy/Government Relations Committee to spearhead these efforts.

Publications. Human Factors and Ergonomics in Design continue to be successful (thanks to Editors Nancy J. Cooke and C. Melody Carswell, respectively). We look forward to the first issue of the Journal of Cognitive Engineering and Decision Making under the editorial leadership of Mica R. Endsley. We have also completed our first edition of Review of Human Factors and Ergonomics, which is being edited by Raymond S. Nickerson. The first volume will launch later this month.

Annual meeting. The annual meeting is one of the major activities of the Society. Volunteers devote a tremendous amount of time and energy to put together a strong program every year. Barrett S. Caldwell leads this effort as chair of the Technical Program Committee, with help from the strong team he has assembled. We also plan for growth and adaptation to changing member needs through our Annual Meeting Policy Committee, chaired by Mark W. Scerbo.

National Ergonomics Month. This outreach effort has been extremely successful under the leadership of Ronald G. Shapiro.
Thanks for the Memories...
(continued from page 1)

There is a wealth of valuable information on the NEM Web site, http://hfesmem.org/.

Chapter affairs. Donald L. Lassiter, chair of the Chapter Affairs Committee, has succeeded with his committee members in providing support for chapters that wish to rejuvenate or to become more active. The committee initiated a new award this year for local chapters.

Student affairs. D. Kristen Gilbert and Anthony D. Andre co-chaired the Student Affairs Committee and continue to engage our student members in the activities of the Society through list servers, activities such as the book drive and the review of the annual meeting program, Student Career and Professional Development Day at the annual meeting, and awards for outstanding students and student chapters.

Standards activities. HFES is actively involved in U.S. standards and best practices. (The Standards and Best Practices Committee is chaired by Thomas J. Albin.) We are also participating in international standards with Kathleen M. Robinette as the overall chair of the TC 159 Committee on Ergonomics, along with subcommittees SC1 – Ergonomic Guiding Principles (chaired by James R. Williams), SC3 – Anthropometry (chaired by Clare C. Gordon), SC4 – Ergonomics of Human System Interaction (chaired by James R. Williams), and SC5 – Ergonomics of the Physical Environment (chaired by Sheryl L. Chappell).

Plans for a year-long celebration of our 50th anniversary. Douglas H. Harris is chairing the 50th Anniversary Task Force, which is developing some wonderful ideas to both celebrate our history and plan for our future. The kick-off for the celebration will be at the 2006 Annual Meeting in San Francisco.

This is an impressive list, and it is by no means representative of all the activities the Society has engaged in over the past year. Perhaps you see why I am so impressed with everything we do. I hope also that you see how we have been responsive to the wishes of our membership. In the December 2002 issue of the HFES Bulletin, we published the results of an all-member survey. Some of the key issues that members wanted us to engage in were promoting the exchange of HF/E scientific and technical information among members, supporting the advancement of HF/E as a science, supporting the practice of HF/E, and conducting outreach activities to industry leaders, government decision makers, and the general public. These goals are well represented in the list above.

In closing, let me say thank you for a fun and intellectually stimulating year. I am honored to have served as the president of an organization that plays such an important role in our society.
Who Cares About Standards? YOU Should!

By Kathleen M. Robinette, ISO Standards Committee Chair

Many people think standards development is as boring as reading a user’s manual. But if you want lots of people to buy your products or services, then you should consider participating in standards development. First of all, not only will you be able to ensure that your products or services are taken into account in the standard, but you will be able to promote them. The level of detail you can communicate in a standards meeting is much more than you can communicate in almost any other forum, and the standards groups are intentionally composed of diverse organizations that will include some of your customers as well as your competitors.

Second, the process of developing a standard necessarily involves sharing your information, and that is a boon for business. In my case, for example, the Air Force Research Laboratory (AFRL) shared anthropometric (body size) data and methods for the development of an apparel sizing standard. Not only did a sizing standard result that included a reference to AFRL, but apparel companies hired AFRL to help develop their products for specific markets. After all, who better to hire than someone who developed the information and wrote the document?

In addition, AFRL has shared the CAESAR body measurement data with various universities and companies around the world, which in turn have developed software for use in human animation and 3-D shape searching over the Internet. Now AFRL has the software these groups developed without having to pay the development or maintenance costs, and the organizations that developed the software are also providing AFRL with free advertising when they sell their products. As a result, more and more people want the CAESAR data for their own software development, and they want AFRL’s assistance in extracting the information pertinent to their particular product or in gathering new information in a similar manner.

Third, whenever you attend standards meetings and participate in the process, you learn about the marketplace, the competition, and consumer needs for developing new products and/or services. This helps to ensure that you stay in touch with your customers and remain at the innovation forefront.

Fourth, competitors who participate in standards committees often team up to share costs for the development of capabilities that they all need but that are too expensive for any one group. For example, the Society of Automotive Engineers (SAE) G-13 Committee, made up of competitors from the automotive and aerospace industries, and the American Society for Testing and Materials (ASTM) International D-13 Committee, made up of competitors from the apparel industry, teamed up to fund the CAESAR study.

The umbrella organizations for the standards development – such as SAE, ASTM, and HFES – have ways to facilitate these kinds of collaborations.

Finally, the best part of standards work for me is personal satisfaction. Not only do I get satisfaction from helping to ensure that better, safer products are in the marketplace, but I have met wonderful, interesting people from all over the world.

If you are interested in participating in HFES standards, indicate your area of interest and send an e-mail to HFES Executive Director Lynn Strother at lynn@hfes.org. She will forward it to the appropriate committee chair within the HFES Institute, the Society’s umbrella body for standards development.

Human Factors Standards: Get Involved!

By Clete Booher

In today’s world of rapidly expanding technology, human factors/ergonomics (HF/E) standards are becoming exceedingly important in the design of usable human-systems interfaces. Are you aware of all of the HF/E-based standards, handbooks, and other guidance documents that are available for use in the development, testing, and evaluation of various products? Despite our Society’s long involvement in such standards development and promotion, many HF/E practitioners probably aren’t aware of the existence or usefulness of these documents. This article presents two opportunities to learn more about HF/E standards during the 49th Annual Meeting.

The Executive Council recently reaffirmed the importance of HFES participation in standards development as a component of the strategic objective to transition science to practice. But we need more Society members to get involved in the creation of HF/E standards and best practices documents. This involvement needs to include participation by HF/E practitioners to ensure that these documents are relevant and useful.

Historically, only a small subset of Society members have had the time and institutional support to actively participate in standards work. The members involved in this work (of whom I am one) believe, however, that human factors standards and best practices documents would benefit substantially from broader expert participation in their creation. We also think that younger HF/E professionals will benefit from exposure to these documents and the principles and practices behind them. To help expand participation in the Society’s standards activities, we are proposing the formation of a Human Factors Standards Technical Group. Members of such a TG would be kept aware of all ongoing national and international HF/E standards and best practices programs. They could volunteer to serve as reviewers or as authors of standards documents in their areas of expertise. They could also ensure that the Society’s positions are reflective of the experience and expertise of our very broad constituency.

You are cordially invited to drop by our Standards Booth.
Bridging the Gap Between Research and Practice

By Betty Sanders, Immediate Past HFES President

One of the major challenges facing the Human Factors and Ergonomics Society and the human factors/ergonomics (HF/E) profession in the past, present, and future is bridging the gap between research and practice. Most HF/E professionals focus on one of these two areas throughout their careers, but remarkably few professionals work on both. Too few researchers devote time and energy to translating their results into language that can be easily used by the practitioner, and too few practitioners identify for the researcher the information they need to improve the quality of their tools and methods.

Therefore, I have chosen to make “Research to Practice” the topic of the President’s Forum at the 49th Annual Meeting in Orlando. The following group of Society leaders has been assembled to express their views on the topic and stimulate discussion:

- Randolph G. Bias, associate professor at the University of Texas in Austin
- Kenneth R. Boff, chief scientist at the U.S. Air Force Research Laboratory, Wright-Patterson Air Force Base
- K. Ronald Laughery, Jr., president of Micro Analysis & Design
- Arnold Lund, usability engineering manager at Microsoft Corporation

Special guest panelist R. Delon Hull, associate director for Research & Technology Transfer at the National Institute for Occupational Safety and Health (NIOSH), will talk about the Research to Practice Program (r2p) developed and implemented for NIOSH. He will also provide insight into how such a program could be designed and implemented for the HF/E profession.

The President’s Forum will be held on Tuesday, September 27, from 10:30 a.m. to 12:00 noon in Pacifica 3, immediately following the opening plenary session. As HFES strives to expand its influence outside the profession, this seminar will focus on the Society’s need to consider internal expansion as well. This is an event you will not want to miss.

HFES Oral History

HFES Pioneers Video Series Editor Dennis Beringer, who has been capturing video interviews of pioneers in human factors, is interested in extending this project for the HFES 50th Anniversary year. Beginning at the HFES 49th Annual Meeting, Beringer will be conducting brief (5–15 minute) video interviews to capture recollections and reminiscences about the history of the field and the Society. If you will be at the 49th Annual Meeting and would like to share an anecdote, please send an e-mail message to him at dennis.beringer@faa.gov. For members who will not be at the meeting, Dennis would also be interested in receiving DVDs of your contributions to the HFES Oral History Project. You may contact him at the same e-mail address.

HFES 50th Anniversary

Many ideas and suggestions have been received from members for ways to celebrate the 50th anniversary of the Society. Based on review by and inputs from members and ex-officio members of the 50th Anniversary Task Force and the Executive Council, these have been consolidated into a set of eight principal efforts, and plans for their implementation have been developed.

To provide an opportunity for members to review and discuss these plans and to offer additional suggestions for their refinement and implementation, the task force will conduct a meeting at the 49th Annual Meeting in Orlando on Thursday, September 29, from 10:30 a.m. to 12:00 noon in Pacifica 10.

Elections

2005 Election Results

The following HFES members were elected to serve beginning in Fall 2005:

President-Elect
Waldemar Karwowski, University of Louisville, Louisville, KY

Secretary-Treasurer-Elect
William S. Marras, Ohio State University, Columbus, OH

Executive Council Members-at-Large
Arnold M. Lund, Microsoft Corporation, Redmond, WA
John Brian Peacock, Embry-Riddle Aeronautical University, Prescott, AZ
Nominations for IEA Awards

By Michael S. Wogalter, HFES IEA Representatives Committee Chair

The International Ergonomics Association (IEA) invites HFES members to nominate members for IEA awards:

• IEA Fellow Award
• IEA President’s Award
• IEA Distinguished Service Award
• IEA Outstanding Educators Award
• IEA Award for Promotion of Ergonomics in Industrially Developing Countries
• IEA Ergonomics Development Award
• IEA/Liberty Mutual Prize and Medal in Ergonomics and Occupational Safety
• IEA/K. U. Smith Student Paper Award (see below)
• IEA/JOSE Best Paper Award

In particular, HFES members are encouraged to nominate HFES Fellows and Honorary Fellows for the IEA Fellow Award. The IEA Fellowship was created to recognize extraordinary or sustained, superior accomplishments of an individual to the ergonomics profession or discipline at an international level.

To be considered by the IEA Awards Committee, candidates must meet two eligibility criteria: (a) international service (including such activities as service to IEA, an extensive publication record in international journals, international consulting, or service to the United Nations or similar organizations) and (b) membership in an IEA federated (e.g., HFES) or affiliated society for at least 10 years. HFES endorsement for this award further requires that the nominee be an HFES Fellow or HFES Honorary Fellow. Additional information about the award, nomination form, and list of past recipients can be found at the IEA Web site, http://www.iea.cc.

Nominations are due to HFES by March 1, 2006. Note that this deadline is earlier than that shown on the IEA Web site because nominations from HFES require prior endorsement from the Society before they are forwarded to the IEA.

Please send an electronic copy of a completed nomination form, copy of the nominee’s current CV, and any supporting material to Mike Wogalter, HFES IEA Delegate Committee Chair, wogalter@ncsu.edu. Questions may be directed to Executive Director Lynn Strother (lynn@hfes.org). Additional information regarding IEA awards can be obtained at http://www.iea.cc and from IEA Awards Chair Waldemar Karwowski, karwowski@louisville.edu.

IEA Student Award

The International Ergonomics Association (IEA) is seeking applicants for the K. U. Smith Student Award. The award honors a deserving student responsible for an application or contribution to human factors/ergonomics (HF/E). The next award will be presented during the IEA XVIIth Triennial Congress, July 10–14, 2006, in Maastricht, Netherlands.

The winner will receive a cash award of $3,000. Depending upon need, an additional stipend for travel to the congress also may be awarded. Certificates will be awarded to two runners-up.

Any student enrolled in an accredited postsecondary institution worldwide is eligible to apply for the award. All areas of HF/E are eligible for consideration. Examples of applicable projects include an applied HF/E project, a human performance study or analysis, a design project or product, a research project undertaken in the laboratory or the field, or a theoretical/conceptual contribution to HF/E.

To apply for the award, submit the following to the IEA Student Award Committee (see below):

• Five copies of an abstract for a paper that the student has authored that documents an application of or contribution to HF/E
• A résumé up to four pages in length, including name, full address, e-mail and phone numbers; institution enrolled in; experience; list of publications; and a summary of accomplishments and/or contributions related to the field of HF/E
• A letter from the student’s academic adviser on institutional letterhead certifying that the paper described in the abstract was written by the student, that the student was enrolled in the academic program at the time the work described in the abstract was carried out, when the work described in the abstract was carried out, and that the abstract is being submitted for the IEA K. U. Smith Student Award.

The deadline for submitting applications is October 2, 2005. Applications for the IEA K. U. Smith Student Award should be sent to IEA Student Award Committee Chair Michael Smith, Department of Industrial Engineering, University of Wisconsin, 1513 University Ave., Madison, WI 53706, 608/262-8454, mjsmith@engr.wisc.edu. Visit http://www.iea2006.org for more details about the award.

New HFES Publications

You can now order these new HFES titles at hfes.org:

“Extra-Ordinary” Ergonomics, by Karl H. E. Kroemer, explains how to assess and determine the abilities and needs of very big and very small people, the disabled and elderly, pregnant women, and children, and demonstrates how to design tools, homes, and environments to make working space safe and living space easy for them. 272 pages, 6 x 9”, $70 for members plus shipping/handling.

HFES100 Human Factors Engineering of Computer Workstations is a canvass draft document that updates BSR/HFES100,
released in 2002. ANSI/HFES100 will be submitted for acceptance as a new American National Standard later this year. 123 pages, 8.5 × 11”, PDF format on CD-ROM, $50 for members plus shipping/handling.

HFES 2005 Compensation Survey report contains 19 tables summarizing the data obtained from a random sample of HFES members (excluding students and retired members) who responded to a questionnaire distributed early this year. Includes respondent characteristics; pay data broken down by region, degree, years of experience, and employment state; and benefits and perks by market sector. 26 pages, 8.5 × 11”, PDF format on CD-ROM, $50 for members plus shipping/handling.

Call for Feature Articles

By Pamela Savage-Knepsheid, Bulletin Features Editor

The HFES Bulletin invites you to submit brief news articles (1500 words maximum) of general interest to the membership, including, but not limited to, summaries of interesting or innovative work in the human factors/ergonomics field or a closely related field; developments in institutions, agencies, and organizations that have a bearing on Society members; and reports of meetings, activities, and events relevant to members’ interests.

Articles describing products, systems, tools, or environments that could be significantly improved through the application of human factors research and methods are particularly encouraged.

Please send me your submissions or feel free to suggest ideas for article topics by contacting me at psavageknepsheid@arl.army.mil, 732/427-3854.

Calls for Papers

IEA Congress 2006

The International Ergonomics Association (IEA) invites submissions to its triennial meeting, the 16th World Congress in Ergonomics, to be held in Maastricht, Netherlands, July 10–14, 2006.

The IEA 2006 program includes plenary papers, technical session papers, symposium papers, posters, interactive workshops, master classes, and discussion panels in all areas of ergonomics or human factors, including aspects of health and safety, organizational design and management, participative design, education and certification, skills in ergonomics, and management topics.

Authors may submit four types of proposals: scientific, including research and review papers or posters; technical, case study papers and application papers or posters; special interactive sessions such as panels, workshops, roundtables, or hands-on activities; and symposia, one or several sessions on a specific theme, either scientific, technical, or a mix of both. Proposals for any other format of presentation or for an interactive activity are welcome.

All proposals and full papers should be submitted electronically. Abstracts cannot be submitted by e-mail; authors unable to submit in a digital format may fax proposals to +31-433-619-020. The deadline for submitting abstracts is October 1, 2005. The due date for posters is January 1, 2006. For more information about the 2006 IEA Congress, go to http://www.iea2006.org.

Designing Interactive Systems

The Association for Computing Machinery (ACM) is seeking submissions for DIS 2006, a conference on designing interactive systems. DIS 2006 will take place June 26-28, 2006, in State College, Pennsylvania. DIS welcomes papers on all varieties of interactive systems and on design analysis, design representations, design methods, design rationale capture, presentation and use, and tools and environments for designing interactive systems. DIS welcomes empirical studies of design practices, including comparative studies, experience-based studies and lessons learned from design projects, investigations, development of formal notations and models, and new theoretical perspectives.

The deadline to submit papers is December 15, 2005. For more information, please contact John M. Carroll, Pennsylvania State University, 307H IST Bldg., University Park, PA 16802-6823, 814/863-2476, fax 814/865-6426.

People

Brian Carnahan (1966–2005)

Brian Carnahan, an assistant professor of industrial and systems engineering at Auburn University since 1999, died February 22, 2005, in Pennsylvania of complications from cancer.

Carnahan was a member of the graduate faculty at Auburn and the Injury Control Research Center at the University of Alabama at Birmingham. He was also director of research for the Occupational Safety & Ergonomics and Injury Prevention Programs for the Deep South Educational & Research Center for Occupational Health & Safety. Carnahan’s research interests were in human factors and biomechanics and the application of operations research techniques to these areas.

He is survived by his wife, Paula; his daughter, Megan Jean; and twin sons, William and Nathaniel.

John M. Carroll was elected a fellow of the Institute of Electrical and Electronics Engineers (IEEE) “for contributions to human-computer interaction methods and science.” Carroll, the Edward M. Frymoyer Chair in Information Sciences and Technology at Pennsylvania State University, may be reached at 307 H, IST Bldg., University Park, PA 16802, 814/865-3528, jcarroll@ist.psu.edu.
The 2004 International Ergonomics Association/Liberty Mutual Prize was awarded to **David M. DeJoy** for his paper “Behavior Change Versus Culture Change: Divergent Approaches to Managing Workplace Safety.” He may be contacted at the University of Georgia, Dept. of Health Promotion and Behavior, 300 River Rd., Athens, GA 30602, 706/542-4368, fax 706/542-4956, ddejoy@coe.uga.edu.

**Lawrence J. Prinzel** was given the 2005 Doug Ensor Award in the Young Engineer of the Year award competition by the Peninsula Engineers Council. He may be reached at NASA Langley Research Center, Research Technology Directorate, Mail Stop 152, Hampton, VA 23681, 757/864-2277, lj.prinzel@larc.nasa.gov.

### In the News

Cognitive psychologist **Mary P. Czerwinski** was featured in the February 14 article “You There, at the Computer: Pay Attention” in *The New York Times*. Czerwinski, a senior researcher at Microsoft, was quoted about her research on the effect of interruptions on deep cognitive immersion. Her research group is investigating the effect of incoming e-mail prompts on cognitive flow moments.

**Alan Hedge**, a professor of ergonomics at Cornell University, described the potential for repetitive motion disorders related to using wireless data devices in a March 13 story in the Fort Wayne, Indiana, *Journal Gazette*. Hedge described the possibility of an increasing number of thumb injuries caused by using PDAs and cell phones.

The work of Florida Institute of Technology researcher **John E. Deaton** was featured in a March 20 article in *Florida Today*. Deaton, director of the Human Factors Center in the School of Aeronautics, is developing VECTOR, a video game designed to teach U.S. soldiers to be culturally sensitive in a variety of circumstances they are likely to encounter in foreign countries.

### National Research Council Awards

The National Research Council offers awards for independent postdoctoral and senior research to be conducted in residence at participating U.S. government laboratories. Awards are offered in most scientific disciplines, including machine/human interface, human factors, and industrial engineering and ergonomics. Applicants are to design their own research projects to be compatible with the interests of the sponsoring laboratory. Stipends for recent Ph.D. recipients range from $36,000 to $65,000 and can be higher with additional experience. Awards include relocation fees, professional travel, and health insurance. Detailed information, including list of participating laboratories and instructions on how to apply, can be found on the National Academies Web site at [http://www.national-academies.org/rap](http://www.national-academies.org/rap) or by contacting 202/334-2760, rap@nas.edu.
How to Accommodate Small and Big Persons, The Disabled and Elderly, Expectant Mothers, and Children

BY KARL KROEMER

Volume 4, Issues in Human Factors and Ergonomics

Supervising Editor: Jefferson M. Koonce

HFES proudly announces its newest title, copublished with CRC Press, “Extra-Ordinary” Ergonomics, a comprehensive guide to designing for special populations.

Underlying the need for extraordinary ergonomics, the book illustrates various approaches to measuring the characteristics, capabilities, and limitations of those who differ from the norm. Kroemer explains how to assess, and determine abilities in needs and demonstrates how to design tools, homes, and environments to make working and living easier. Researchers and students will find helpful information about measuring people’s sizes, strengths, weaknesses, and capabilities, and from this information determine the needs for specific ergonomic solutions. The book enables human factors and industrial engineers, architects, and designers to devise work tasks, devices, tools, and environments that are appropriate to the special needs of users. Health care professionals and employers will discover ways to help people who suffer from temporary or permanent disabilities so they can cope with the demands at work, at home, or in a care facility.

ISBN 0-8493-3668-6, 272 pages, 6 x 9”, hardcover, $70.00 for HFES members, $79.95 for nonmembers, plus shipping/handling. View the detailed table of contents and author biography, and order online at http://www.hfes.org/Publications, or contact HFES at P.O. Box 1369, Santa Monica, CA 90406-1369 USA, 310/394-2410.

This book makes a compelling argument that within the ergonomics community, there needs to be a much greater emphasis on extreme variations in population attributes. It very nicely illustrates the performance capability of various groups, and some quantitative designations are given. Insights to accommodate specific needs are needed to be taken into consideration in the design of extraordinary populations. The authors do this well, and it is a great book for all involved in ergonomics.

– Don B. Chaffin, Distinguished University Professor, University of Michigan