AMERICAN CHEMICAL SOCIETY
DIVISION OF ANALYTICAL CHEMISTRY
NEWSLETTER

ANALYTICAL CHEMISTRY SERVES HUMANITY
THE SCIENCE OF CHEMICAL MEASUREMENTS FOR
MEDICINE INDUSTRY ENVIRONMENT FOOD

SUMMER 2001 ISSUE

Analytical Chemistry, Just Look at You Now!

Larry R. Faulkner
Office of the President
University of Texas at Austin
Austin, Texas 78712

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New Orleans, Louisiana
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It is with the warmest pleasure that I participate in this symposium on Electrochemistry in the 21st Century, which is intended to frame the presentation of the 2001 Pittsburgh Analytical Chemistry Award to Allen J. Bard, my teacher, mentor, colleague, coauthor, and friend of 35 years. Four of the capacities that I have just named—teacher, mentor, colleague, and friend—are roles that Al has also fulfilled in the lives of countless other scientists active in the last half century of remarkable progress. Many present in this room would say so on their own behalf. No small number of colleagues can further claim a link to him in that fifth role: coauthor. What a remarkable impact he has had.

Breathtaking is the word that I would apply to the scale and quality of Al's contributions: to individual scientists and to science as a whole, to the literature of science and to the venues of literature that set standards used by scientists everywhere, to the health of science as a social enterprise and to the effectiveness of science in promoting the health of the larger society, to science as a calling and to science as an inspiration. The Society for Analytical Chemists of Pittsburgh has chosen wisely, not only because Allen Bard merits the Award, but also because the Award merits Allen Bard.

Al, I join everyone here in extending congratulations. When I joined your group in the fall of 1966 little did I know that you would become a legend in your own lifetime, and little did I know that we would form a relationship that would flourish so richly over so many years. I am grateful to you and I honor you.

This occasion combines ceremony with serious science. When Al suggested some months ago that I participate, I knew that I could handle the ceremony, but I was not so sure about the serious science. After all, it has now been about seven years since I closed my laboratory, and it has been three since I delivered what I declared to be my last scientific presentation here in New Orleans in 1998. What could I offer now that might have value to an audience of active scientists working on the leading edge?

Well, it's certainly not a new body of experimental results...

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You're invited to the next DAC executive committee meeting

The executive committee meeting in Chicago, will be on **Saturday, August 25th, 2001**, time and location to be announced.

You may suggest items to be discussed by sending them by electronic mail to Prof. John N. Richardson, the Division Secretary or by fax to (717) 477-4048.

The Division 1) Provides a forum for discussions of advances in Analytical Chemistry. 2) Increases awareness of the field on other scientists and the general public. 3) Encourages students to select Analytical Chemistry as their field of study. 4) Advises the ACS on matters related to Analytical Chemistry and 5) Offers analytical chemists opportunities for professional contacts.

CHAIR Bruce Chase
(302) 695-4434
BRUCE.CHASE@USA.DUPONT.COM

CHAIR-ELECT Catherin Fenselau
(301) 405-8616
FENSELAU@UMAIL.UMD.EDU

SECRETARY John Richardson
(717) 477-1774
JNRICH@ARK.SHIP.EDU

TREASURER Carolyn Ribes
979-238-5496
CRIBES@DOW.COM

www.acs-analytical.duq.edu/analytical.html

Contributions to the next Newsletter should be sent not later than Dec 1st, 2001 to:
Al Ribes - aribes@dow.com

CHICAGO

Analytical Division Sessions

Sessions at McCormick Place - North	S	M	T	W	T
Analytical Chemistry: 125 Years and Going Strong	D				
Contributed Papers-Poster Session	E				
Microscale Separations and Analysis		D			
Sci-Mix (Hyatt Regency Chicago)		E			
Analytical Division Awards Symposium			D		
Design and Characterization of Nanostructured Materials				A	
Faster Is Better:The need for Speed in Pharmaceutical Analysis				P	
Subnanoliter Bioanalytical Assays: Single Cells and Beyond				P	
The World According to Process Analytical Chemistry					D
Analytical Tools for Combinatorial Chemistry					D

A = AM
P=PM
E=Evening
D= AM/PM

DAC Dinner at the Chicago Meeting

The Division dinner will be held on Monday August 27th, 2001 at Greek Islands Restaurant, 200 S. Halsted St. Chicago.
phone 782-9855

Cash reception at 6:00, dinner at 6:30.

Cost is $24.00

Greek Islands is within walking distance and the meal will be served family style. It includes wine, galaktoboureko and bakalava.

Locals rate it a **** (four) star restaurant. People propose marriage at this place and others drive from Milwaukee to eat here.

Please, order tickets when you pre-register!
Event 106

From the Chair

Bruce Chase

The health of a division can be measured by two criteria. The first is the programming. In this area I believe the Analytical Division has done an excellent job. I would like to thank both Charlie Wilkins and Catherine Fenselau for the wonderful job of programming which occurred at the spring meeting in San Diego and for the equally impressive program which will occur this August in Chicago. I would encourage everyone to look at this program and seriously consider attending this meeting. The second criteria for evaluating a division has to be participation by the members. In this area we can certainly improve. While there are many dedicated members working very hard in areas ranging from student awards to web page efforts, I would still like to see more people working within the Division. If you have an interest in working on specific committees or possibly in running for divisional office in the future, please speak up. Additional hands and new perspectives are always needed. Finally, I would like to congratulate this year's award winners. You can see short descriptions of the awards and awardees on the division web page, http://www.acs-analytical.duq.edu/. By the way, when you are there, please explore. We would love to have feedback on the new page design and organization. Roland Hirsch has done a wonderful job at organizing our web presence. See you all in Chicago.

Treasurer's Report for 2000

Financially, the Division of Analytical Chemistry had an excellent year in 2000. We have two major sources of funding. The most critical is support from industrial sponsors who support the Division awards, fellowships, and special symposia at national meetings. Most of those funds are dedicated to specific budget items. Discretionary spending is supported by membership dues as well as the annual allocation from ACS.

The Division spends the majority of the budget on sponsored programs, including the Division awards, Graduate Fellowships, and sponsored symposia. A significant fraction of discretionary income is spent on technical programs for national ACS meetings and at other conferences. Operating expenses, including printing and distributing the newsletter and committee and officer expenses, are the third largest expense. Discretionary funds are also used to support the Division Undergraduate Award and Kolthoff Award programs. The bottom line is that the funds are used to support technical programs in analytical chemistry, support undergraduate and graduate students, and recognize professional excellence.

For fiscal year 2000, the Division had a slight surplus (higher income than expenses) which will be used to increase the Division reserves in the money market account . Our current reserve level is below that recommended by the ACS.

The Division is very dependent on support from our corporate and institutional sponsors and we really appreciate the efforts, energy, and partnership of those that provide this support.

Income for 2000

Programs (sponsored symposia, royalties, EAS, etc)	**$22,541**
Sponsors of programs (Div. awards and Grad. Fellows.)	**$151,400**
ACS income (dues, allocation from National, etc).	**$129,240**
Interest	**$2,447**
	Total $ 305,629

Expenses for 2000

Meeting programs and conf. (ACS mtgs, Pacifichem, etc)	**$69,079**
Sponsored progr.(Div. awards, Grad Fell., spons.symp.)	**$162,690**
Op. expenses (newsl., travel, officers, mail, etc)	**$44,221**
Unspons.student awards	**$23, 012**
	Total $ 299,003

The Division appreciates the support of our sponsors during the last 6 months

Phillip Morris U.S.A.
E.I.Dupont de Nemours & Co.
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Biosite
Abbott Laboratories
Novartis
ACLARA BioSciences
Applied Biosystems
The Dow Chemical Co. Foundation

Division of Analytical Chemistry Awards

Solicitation of Nominations
Deadline for Submission: September 1, 2001

Consult the Division Web Site for the award guidelines at www.acs-analytical.duq.edu/analytical.html

Graduate Fellowship Program Deadlines for 2002

Graduate Fellowship Program Applications for 2002-2003 Fellowships will be due on DECEMBER 7, 2001. See the Graduate Fellowship Committee web site for details: www.wabash.edu/acsgraduatefellowship/home.htm.

Division Web Site News

The Division Web Site redesign is now complete. The home page has a completely new look and navigation is easier than before. Abstracts for Division of Analytical Chemistry sessions at the last three ACS National Meetings are available for download from the site. Further updates are planned for the coming year. This will likely include improved access to meeting abstracts, past issues of the Division Newsletter, and eventually an on-line directory of members who have agreed to be listed. Information on upcoming meetings always is welcome, as are other links that might be of interest to analytical chemists.

Roland F. Hirsch
rfhirsch@earthlink.net

Graduate Fellowship Program Volunteers

Thanks!

Members of the 2000-2001 Graduate Fellowship Committee, who should be recognized for generously giving many hours of effort in evaluating applications and selecting recipients were: David Burinsky - Glaxo-SmithKline. Paul Edmiston - College of Wooster. Patrick Epperson - Lawrence Livermore National Laboratory. Nile Frawley - Dow. Angela Harmon - Merk & Co. Mary Kaiser - DuPont. Margaret Merritt - Wellesley College. Grover Owens - Procter & Gamble. Eugene Ricakrd - Eli Lilly. Candace Sass - Eastman Chemical. Al Sharkins - Society of Analytical Chemists of Pittsburgh. James Weber - R.W.Johnson Pharmaceutical Research Institute.

The Division needs Volunteers

To learn more, contact
Theodore Williams
phone: 330-263-2115
or send e-mail to
williams@acs.wooster. edu

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Analytical Chemistry, Just Look at You Now

Probably my best shot is to offer some perspectives. Those that I present are based partly on age and partly on the reality that I now spend my days talking with a very broad range of people, including those who set agendas in business, government, private foundations, education, the media, and other aspects of American life. I'd like to offer a look at where analytical chemistry has been and where it might go.

"Analytical Chemistry, Just Look at You Now," I say in the title for this talk. We have all heard this kind of phrase from an older person speaking to a child grown up. It bespeaks wonder and pride at the changes suddenly realized by the beholder. These are my reactions now when I behold our field.

It's unnerving to realize that my career in science reaches back almost four decades, but it's true.

In the middle 1960s, analytical chemistry was near death. Despite ideas in common circulation at that time, the surviving analytical chemists were not actually paranoid. As everyone knows, it's not paranoia when they really are out to get you. On the academic side, chemistry department after chemistry department was eliminating faculty and curricula altogether in analytical chemistry. On the industrial side, the practice of analytical chemistry continued out of practical value, but there were very few industrial organizations that could or would host the kind of creative activity and network building that must furnish vitality to any genuine field of science. Analytical chemistry seemed to have burned out. It seemed to be producing neither new scientific concepts nor new tools that the rest of science found valuable. Advances in what we now recognize as analytical chemistry were being made, but mostly by others outside the field.

Then everything changed. In the decade of the 1970s, the field rose from its ashes like the phoenix, vastly more powerful than ever before. In retrospect, it was a marvel. In real time, it was tremendously exciting. How did it happen? I think these were very important factors:

- the rapid success of the environmental movement
- the very broad impact of the quality movement
- advances in chemically-based health care
- the explosion of the microelectronics industry
- the development of information technology based on microprocessors

Serious environmental concerns gave rise to a demand for information of diagnostic value, most of it chemical, and by the middle of the 1970s, essentially all major industries were facing a regulatory environment where sophisticated analytical information was of critical importance.

The quality movement was born of intense competitive pressures, but it gave rise to a culture where diagnostic measurement became deeply embedded in product improvement and product development cycles. In any industry dealing with substances of any kind, the diagnostic measurements of value are very often chemical.

Many advances in health care since the 1960s have rested on the much-enlarged use of clinical diagnostics, many based on analytical chemistry, and pharmaceutical treatment working hand-in-hand with continued clinical monitoring.

The growth of the microelectronics industry reinforced the success of analytical chemistry in two distinct ways. First, this industry was itself an important arena for challenging new analytical measurements involving spatial resolution of chemical information on unprecedented distance scales. Thus, like the environment, industrial process control, and the world of health care, the microelectronics industry became a large domain for innovation in analytical measurement and application. But it also gave rise to reliable, versatile electronics that enabled invention after invention in the area of chemical instrumentation and gave rise to a much larger industrial base supporting instrumentation itself.

I separate information technology based on microprocessors from the microelectronics industry, because I see the qualitative effects as different, even though the information technology itself rests on progress in the microelectronics industry. The microprocessor and the information technology that flowed from it made possible, even by the late 1970s, whole new approaches to chemical measurement via instruments packaged in small, affordable units. Techniques resting on the use of mathematical transforms, methods requiring immediate access to databases, protocols involving precise, multistep sample handling, the automation of complex measurements, or the management of large numbers of samples suddenly became practical.

As scientists, we have a tendency to look at this history in terms of the demand for capabilities and methodologies, just as I have done here. But let me cast things another way by pointing to social impact. Over the past four decades, advances in analytical chemistry have become critical to huge movements in social affairs, business and industry, politics, and international relations. The evolution and expansion of health care, environmental protection and remediation, international competitiveness in manufacturing, and the prevention of terrorism are just four fields in the forefront of public concern where the pace of history and the likelihood of future progress rest on analytical instruments and methods. Business and government leaders, and even the public at large, have come to understand that analytical measurements are indispensable to the modern management of individual commercial enterprises or social issues of huge scale. None of this seems likely to fade. It's satisfying indeed to see such impact for a field that seemed to have such poor prospects not so very long ago.

As I mentioned earlier, analytical chemistry was practically moribund in the middle 60s. The fact that it rose so powerfully so soon thereafter was, as I have argued here, in large measure the result of social necessities of enormous importance. But even in the 60s there were leaders who laid a foundation for a radically modernized field of analytical chemistry. I would like to credit a few:

•Fred Findeis, Program Director for Analytical Chemistry at the National Science Foundation in the 1960s and 1970s, was a public servant of extraordinary effectiveness and vision, who understood that the analytical chemistry of the future would need to draw from a strong scientific base and that it would need to include people interested in a wide range of measurements not traditionally part of analytical chemistry. He put the Foundation's money where his

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thoughts were, and his efforts helped to redefine field and to foster new talent committed to it.

• Herbert Laitinen, Editor of *Analytical Chemistry* throughout the 1960s, was a man of considerable vision who understood the importance of linking the existing field with related science and engineering outside the field. Laitinen also appreciated the great importance that environmental measurements would come to hold.

•Howard Malmstadt, Professor of Chemistry at the University of Illinois, was at least a decade ahead of others in understanding the great qualitative changes that could occur in analytical chemistry by taking advantage, first, of the advances in microelectronics and, later, by the new technology resting on microprocessors. Malmstadt also anticipated the explosive growth that would occur in clinical analytical chemistry.

• Charles Reilley, Professor of Chemistry at the University of North Carolina, had a catholic mind and remarkable chemical insight. He understood that analytical chemistry beyond his time would draw from unexploited chemical concepts, from processes in new media, and from the newer techniques of physics and physical chemistry. He encouraged younger colleagues to redefine the boundaries of the field, and his inclusive attitude became important to the explosive growth in subsequent decades.

An old adage says that success has many fathers. That is certainly true of any success on the scale that analytical chemistry has enjoyed. The few whom I have mentioned were joined by others around the world in forging the modern field. It is not possible for me to give particular credit to all who deserve it. These four were leaders whose genius I was able to experience personally, and it's simply my liberty to credit them by name here.

Among those many fathers were members of a remarkable crop of top-flight electroanalytical chemists who began their independent careers in the 50s and 60s. One of them was Al Bard himself; others are speaking in this very symposium. Their imagination and energy transformed electroanalytical chemistry and expanded its horizons vastly. They connected to physical chemistry, inorganic chemistry, organic chemistry, biochemistry, physics, surface science, neurobiology, kinetics, optical spectroscopy, separations, and many other active areas of research.

Among the most important reasons for the success of analytical chemistry, as we know it today, was that it was able to reject the insularity that was killing it in the 60s, to embrace new science, and eventually to recruit large new communities of scientists who had developed extremely valuable analytical technologies but had no previous identification with analytical chemistry. It did not have to be that way. The subfields could have remained islands, and there could have been no successful joint development of the new discipline. The four leaders whom I named helped greatly to create the receptive, welcoming attitude that engendered success. The electroanalytical leadership that I mentioned were also important in this regard.

But we all must give great credit to the Society for Analytical Chemists of Pittsburgh and to their offspring, the Pittsburgh Conference, which began as an instrument show, but grew into the powerfully integrating forum that it has become today. It has perhaps been the most important vehicle for analytical chemistry to expand its boundaries and its community, and yet to maintain coherence, over the past four decades. It was fortunate that the Pittsburgh Conference was already a sizable enterprise by the latter 60s and was ready to accept this essential role during the subsequent decades of tremendous expansion and elaboration of our field.

What can we draw from all of this as we consider the future? Here are four thoughts that have been on my mind:

First, analytical chemistry is already intimately coupled with three themes that will remain in-

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Officers of the DAC Executive Committee for 2001

Chair

Bruce Chase (2000-2001)
E328/163
DuPont Experimental Station
P.O. Box 80328
Wilmington, DE 19880-0328
(302) 695 4434 FAX (302) 695 8412
bruce.chase@usa.dupont.com

Chair-Elect

Catherin Fenselau (2000-2001)
College of Life Sciences
University of Maryland
College Park, MD 20742
(301) 405-8616 FAX (301) 405-8615
fenselau@umail.umd.edu

Secretary

John N. Richardson (2000-2001)
Department of Chemistry
Shippensburg University
Shippensburg, PA 17257
(717) 477 1774 FAX (717) 477 4048
jnrich@ark.ship.edu

Treasurer

Carolyn Ribes (2001-2002)
The Dow Chemical Company
2301 Brazosport Boulevard, B-1463
Freeport, Texas 77541
(979) 238-5496 FAX (979) 238-0100
cribes@dow.com

Councilors

Isiah M. Warner (2000-2002)
Department of Chemistry
Louisiana State University
Baton Rouge, Louisiana 70803
(504) 388-2829 FAX (504) 388-3971
isiah.warner@chemgate.chem.lsu.edu

Charles L. Wilkins (2001-2003)
Department of Chemistry and Biochemistry . University of Arkansas
Fayetteville, AR 72701
cwilkins@comp.uark.edu

Roland F. Hirsch (2001-2003)
20458 Waters Point Lane
Germantown, MD 20874-1091
(301) 903-3213 FAX (301) 903-0567
roland.hirsch@science.doe.gov

Sally Stafford (1999-2001)
Hewlett Packard Company
1000 NE Circle Blvd., Mail Stop 1023B . Corvallis, Oregon 97330
(541) 715-1010 FAX (541) 715-4934
sally_stafford@hp.com

Alternate Councilors

Michelle Buchanan (2000-2002)
Oak Ridge National Laboratory
P.O. Box 2008 Bldg. 5510 Rm. 121 . Oak Ridge, TN 37831-6365
(423) 574-4521 FAX (423) 576-8559
buchananmv@ornl.gov

Thea K. Barbarakis (2001-2003)
Business Group Diagnostics
Bayer Corporation
511 Bendict Avenue
Tarrytown, NY 10591-5097
(914) 524-2325 FAX (914) 524-3323
thea.barbarakis.b@bayer.com

Karen B. Sentell (2000-2002)
BTI Building
Ciba Vision Corporation
11460 Johns Creek Parkway
Duluth, Georgia 30136-1518
(770) 418-3963 FAX (770) 418-3963
karen.sentell@cibavision.novartis.com

R. Mark Wightman (1999-2001)
Department of Chemistry
University of NC-Chapel Hill
Chapel Hill, North Carolina 27599-3290 . (919) 962-1472 FAX (919) 962-2388
rmw@unc.edu

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Piece of cake!

HOW TO JOIN DAC

Send check payable to the Div. of Analytical Chemistry for the membership class:

ACS member $14
NOT ACS member $18
Student $8
(include ACS member number or copy of student i.d. for discount)

Add $2 for enrollment in the Subdivision of Chromatography and Separations Chemistry

Include your name & address and mail to

John N. Richardson
Dept. Chemistry
Shippensburg University
Shippensburg, PA 17257
(717)477-1774
FAX (717)477-4048
JNRICH@ARK.SHIP.EDU

definitely in the forefront of public concern: health care, environmental protection, and economic competitiveness. This triad will constitute a huge, firm base of application far into the future and will shape the character of much of our developing enterprise.

• Health-care costs will continue to exert tremendous pressure on individuals, businesses, and governments because of changing demographics, broadened options for treatment, and rising global standards for care. All scenarios that I can conceive involve increasing demands for analytical information, whether heath-care policies in any particular time or place are focused on cost control, improved quality of delivery, or broadened access.

• Environmental concerns are here to stay. There are serious, real concerns in both global and local contexts; but we remain grossly ignorant about causes and effects and about degrees of threat. We do not really know what we need to control or what we need to fix. There is no way to address any of these concerns—diagnostically, protectively, or remedially—without analytical information. This will be a growth area for fifty years, in my judgment.

• Economic competitiveness rests on many factors, but in any business involving manufacturing or production, it depends at least on the optimization of processes, and it may depend on the speed and effectiveness of cycles leading to innovation or product improvement. Globalization of the economy will make these dependencies even greater, so I foresee increasing requirements for analytical information relevant to these needs.

By the way, it is significant that the last presidential campaign in the United States focused on these three core areas: health care, environmental protection, and economic competitiveness. It's very clear just from that fact that our field is well coupled to central themes of public concern in the United States. The same concerns exist in societies around the world. We can count ourselves fortunate that they will not be passing fads and that analytical information is essential to progress in all of them, regardless of policy. We are even more fortunate that we do not have to take responsibility for the policies themselves.

My second thought is that nanostructures, nanomaterials and nanodevices have the potential for revolutionary technological and economic impact, quite analogous with what we have already seen from microelectronics. In some respects, nanotechnology is an extension of microelectronic technology, but this new sphere of human activity could become even more powerful, not least because it has a broad interface with biology, which is intrinsically nanostructural. An economic impact of nanotechnology on a massive scale is not just around the corner, but a decade or more away, in my view. But the opportunities are there, and realizing them will require a new facet of analytical chemistry. The premium will be on sensitivity to particular spatial relationships among moieties, to supramolecular configurations, and sometimes to small numbers. This is a research area with exciting challenges. Having beaten the drum for it for about 20 years, I am sorry that I can only watch from the sidelines. The difference in the present situation relative to 20 years ago is that synthetic possibilities are much better developed, and economic impact, an invaluable driver of progress, is much closer. It should be fun to watch. A third idea in this series is that the analytical community should keep a close eye on developments in information technology. I have already listed historical progress in this domain as a major enabler of the great advances in our field in recent decades. Analytical chemistry is itself a form of information technology. Analytical chemistry enables action by the way it informs. My point here is that our field has natural connections to the sciences of information management and human-machine interaction. Tremendous things are happening in those fields, and we should expect to make use of them to gain greater value from the information that we produce and to produce even more powerful instrumentation.

Fourth, I would like to make a special pitch concerning opportunities in clinical analysis. I believe that the improvement of health care worldwide will be a major social goal in the decades ahead. But to achieve it, serious reductions in the cost of the most basic clinical diagnostics will be important. Another area where fine opportunities seem to exist is in devices that are sophisticated, simple, and reliable enough for people to provide their own monitoring of important diagnostics. This could be a key to both improved health care and cost control. Great contributions could be made if some imagination could be applied in these directions.

I also wanted to touch upon possibilities for evolution of American research institutions over the next half century in the face of scientific opportunities and public pressures. But this subject is too large for there to be value in my dedicating much time to it in this forum, but let me mention a couple of things: one scientific opportunity and one public pressure.

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Nanoscience is the scientific driver that I will highlight. This theme is causing a sizable shift of focus, not only in chemistry, but also in biology, physics, materials science, and various parts of engineering. Over the next decade or two, it will register a substantial impact on the organization of research and teaching in major universities. Many of those same institutions have already manifested something similar in the reorganizations that have taken place in the life sciences. The classic divisions of biology, including botany, zoology, and microbiology, are now disappearing. We may see similar effects in the physical sciences and engineering as the focus on nanoscience becomes more pervasive.

The public pressure that I mention comes from the broadly held perception that undergraduate education is becoming indispensable to the economic and social success of the next generation. Parents, young people, and, policymakers across the land increasingly believe that this is true. In public life in America, if something is essential to success, it becomes a right; if a right, then undeniable. Particularly in the public sector over the past 15 years, we have seen a tremendous increase in concern over undergraduate programs. Legislatures, governing boards, state-level coordinating boards, and accrediting agencies have taken a sharp interest in the cost of education, admissions policies, student access, freshman retention rates, graduation rates, teaching loads, and post-tenure review. There is now a growing movement to develop outcomes-based methods for curricular accountability.

The consequence is a phenomenon that I sometimes call the "commodification of undergraduate education." In this era, institutional boards, administrations, and faculties are under tremendous public pressure to see that students succeed in an activity deemed essential to their future and that the institutions themselves demonstrably deliver their essential social service as efficiently as possible. This operating environment differs fundamentally from the traditional one based on the dual idea of the faculty as a professional, self-accountable body and the university as a place where the student bears the primary responsibility, by far, for his or her own success. Private institutions are not immune from this shift in concept, because their governing boards and accrediting agencies transmit broader social concerns, and because there is another form of accountability driven by the high tuition charges at private schools.

My purpose in setting out this issue is to suggest that a consequence may be the gradual restructuring of graduate education and research. In America, the combination of research and teaching in powerful universities has been a brilliant success in so many ways, and I do not see the nation abandoning it. However, it will be increasingly difficult to use a unified organizational structure for both functions together, given the change in operating environment for undergraduate education that I have just discussed, and the additional important fact that different sources pay for teaching and research, so that the accountability for success in each sphere is to different people and organizations. Still another factor driving organizational change is that so much of the emerging research agenda deals with intrinsically interdisciplinary topics, which need broad-based institutes and centers to foster the collegial interchange essential to progress. Accordingly, I see American research universities evolving toward a structure in which research is carried out within such organizations in much larger measure. I also expect that professional research staff having long-term employment will become much more common in universities. The result might be something like the French model, featuring strong research institutes funded by CNRS or other national agencies, within universities whose departmental structure is more aligned with the teaching function.

Let me close now by congratulating Al Bard one more time. I surely speak for this whole audience in saying that we are proud of what you have achieved and we are grateful for your personal support of so many of us.

The title of this symposium is "Electrochemistry in the 21st Century," yet I now find myself not having spoken about electrochemistry specifically. The topic that I chose seemed more appropriate to the contribution that I could offer; moreover it seemed well matched to the particular award at hand and to the Pittsburgh Conference more generally. But let me declare that I am confident in the future of electrochemistry, if only because we have found out so little about it in 200 years of study! Just remember that there is no life without electrons. □

FACSS 2001

October 7–12 Cobo Center, Detroit, MI

Federation of Analytical Chemistry and Spectroscopy Societies

Organized Symposia

Analytical Chemistry at National Laboratories ● Analytical Chemistry in the Automobile Industry ● Atomic Spectrometry in the Pharmaceutical Industry ● Atomic Spectroscopy ● Anachem, Lippincott, Meggers, & Strock Awards ● British Atomic Spectrometry ● Chemometrics ● Coherent Two-Dimensional Vibrational Spectroscopy ● Electrochemistry ● Electronic Spectroscopy ● Immobilization of Functional Biomolecules at Interfaces ● Institute for Spectrochemistry and Applied Spectroscopy (Dortmund & Berlin, Germany)● Korean Analytical Chemistry● Lasers ● Mass Spectrometry ● New Investigators ● Oak Ridge National Lab ● Process Analytical Chemistry ● Raman Spectroscopy● Scanning Microscopy ● Separations ● Teaching Analytical Chemistry ● Vibrational Imaging Honoring Bill Fateley● Vibrational Spectroscopy● A.A. Benedetti-Pichler Award symposium, honoring past awardees.

FACSS Workshops: FTIR (Peter Griffiths, James DeHasseth) ● Advanced Chemometrics Online (Neal Gallagher, Jeremy Shaver) ● Process Analytical Chemistry (Chris Hassell, Jim Rydzak) ● Raman Spectroscopy (Richard McCreary) ● Process Applications of Raman Spectroscopy (Mike Pelletier) ● Infrared Imaging (Neil Lewis, Norman Wright) ● Modern Near IR Analysis (Dave Burns) ● ICP-AES / CTD-based ICP-OES (Jean-Michel Mermet) ● Instrumental Methods for Elemental Analysis (Art Varnes) ● ICP-MS (Sam Houk) ● Time Management – Getting Time and Space Organized (Pam McConnell) ● Electronic Time Management – Getting Organized in Virtual Reality (Pam McConnell) ● Spreadsheets for Scientists (Ed Paski)● Molecular Microspectroscopy (Andy Sommer) ● Trace Metal Analysis in Biomedical Applications (Ela Bakowska) ● Preparing your Lab for Trace Metals Determination (Byron Stewart, Kenneth Borowski, Ela Bakowska) ● Hyphonated Methods Using IR (John Hellgeth) ● Professional Analytical Chemists in Industry: A Short Course for Undergraduate Students (Diane Parry) ● Introduction to ICP (Patrick Treado) ● Instrumental Analysis of Polymers (C. Ohlemacher, Robert Pogue) ● GMP Validation of Analytical Spectrometers ● Six Sigma ● Modern Atomic Methods (LIBS, Laser Ablation)● Raman Chemical Imaging ● Chemometrics for Industrial Process Applications ● Chemometrics and Statistics in Analytical Chemistry Lab. Short courses will be conducted by the American Chemical Society. More details are available at the conference web site (http://facss.org).

The Monday evening exhibit opening is a social event. Also, the exhibit hall hosts the Wednesday poster session, complimentary Tuesday lunch, and coffee breaks. This conference will take on a special flavor since it coincides with the celebrations at the Ford Museum of Detroit's Tri-Centennial Year.

For information contact: FACSS National Office,1201 Don Diego Avenue, Santa Fe, NM 87505 Phone: (505) 820-1648 ● Fax: (505) 989-1073 ● Web Page: http://facss.org

2001 AWARDEES

Division of Analytical Chemistry

Congratulations go to this year's DAC award winners!

Recipients will receive a honorarium, a plaque, and travel expenses to the national ACS meeting in Chicago, Illinois to be held on August 26-30, 2001. The awards will be presented at the Division of Analytical Chemistry Awards (DAC) Symposium. Individual symposia have been organized in honor of each of the recipients in addition to the annually hosted DAC Awards Banquet. All of the awards are made possible due to the continuous financial sponsorship from Industry over the past twenty years.

Division of Analytical Chemistry. J. Calvin Giddings Award for Excellence in Education. Sponsored by the Dekker Foundation. Presented to: **Howard Strobel**, Professor Emeritus at Duke University.

A graduate of Washington State College (now University), with a B.S. in chemistry and highest honors, Dr. Strobel worked on the Manhattan Project at Brown Unversity in the group headed by Professor Charles Kraus from July 1943 to the end of World War II. With the end of the war, he continued the physical chemistry project that he had started in Brown in the Fall 1942 to receive a Ph.D. in 1947. His dissertation was entitled "The Effect of Constitution on the Dielectric Absorption of Electrolytes in Solvents of Low Dielectric Constant." He stayed on at Brown for a one year post-doctoral position before accepting a position in the Fall of 1948 at Duke University as an Instructor in Chemistry.

Professor Strobel's interest in chemical instrumentation was kindled during his third year at Duke when he was assigned to direct the laboratory in a chemical microscopy-electroanalytical measurements course. Over the next few years he became a full-fledged analytical chemist and came to realize that achieving a mastery of all kinds of measurements on substances and accompanying theory of behavior might be achieved more completely by taking a sophisticated approach to the instrumentation involved. The product of those insights, and a great deal of study, was the first edition of the book, "Chemical Instrumentation, A Systematic Approach to Instrumental Analysis," which was published by Addison-Wesley. A second edition appeared in 1973 and a third, with Dr. William H. Heineman as a co-author, was published by Wiley-Interscience in 1989. A fourth edition is currently in preparation.

Since 1956, Professor Strobel's professional career as Duke has been split between chemistry and academic administration. For many years he taught an Honors freshman chemistry course featuring small research problems during the fall semester, and a senior-graduate course in chemical instrumentation in the spring semester. Most of his research fell into the area of study of ion exchange phenomena in mixed solvents.

His administrative work began when he accepted a half-time appointment as an academic Dean in Duke's undergraduate men's college in the fall of 1956, beginning a range of activities that over the years accounted for more than one-third of his time. For several years he was also heavily involved in the academic side of Duke's residential program. Altogether the combination of teaching, writing, administrative work, sabbaticals abroad, and directive research for many masters and doctoral students have defined Dr. Strobel's rewarding academic career.

Division of Analytical Chemistry Award In Spectrochemical Analysis. Sponsored by the Perkin-Elmer Corporation. Presented to: **Bonner Denton**, Professor of Chemistry at the University of Arizona in Tucson, Arizona.

Professor Denton received a Bachelor of Science degree in Chemistry and a Bachelor of Arts degree in Psychology from Lamar University in Beaumont, Texas. He then attended the University of Illinois, Champaign-Urbana, where he worked for Howard Malmstadt conducting a variety of research in flame spectroscopy, automation and instrumentation. Upon receiving his PhD. Degree in Analytical Chemistry, he moved to the University of Arizona, Tucson, Arizona, where he attained full professorship in 1980.

Professor Denton's research interests include applying the latest technological advances in electronics, physics, optics, astronomy, acoustics, mechanical engineering and computer science toward developing new and improved methods of chemical analysis and automation. A multifaceted but strongly interlocking program, ranging from new frontiers in mass spectrometry to x-ray diffraction, and from vacuum ultraviolet to infrared optical spectroscopies through intelligent instrumentation, is currently being conducted by an eighteen-member research group. Emphasis is placed both on gaining improved fundamental knowledge and on the application of theoretical concepts for improved analysis of real world samples. Research projects currently under way include selective single photo ionization of complex real world mixtures and studies of new array detectors for spectrometry. Advanced concepts for spectral imaging analysis are also being investigated. New improved approaches for qualitative and quantitative analysis using near IR and far UV Raman are under study. Use of imaging analysis of high performance thin layer chromatography and multiwell plates are contributing to improved high throughput analytical methods.

He has received a variety of honors, including an Alfred P. Sloan Research Fellowship, Outstanding Young Men of America Award, the 1989 ACS Division of Analytical Chemistry Award in Chemical Instrumentation, the 1991 Society for Applied Spectroscopy's Lester Strock Award, and the 1998 Pittsburgh Spectroscopy Award of the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy. In addition, he has served as tour speaker for the American Chemical society and the Society for Applied Spectroscopy. His outside interests include scuba diving, skiing, caving, and building and racing automobiles.

Division of Analytical Chemistry A. F. Findeis Award For Achievements by a Young Analytical Scientist. Sponsored by The Philip Morris Companies. Presented to: **Sylvia Daunert**, Associate Professor of Chemistry and Pharmaceutical Sciences at the University of Kentucky and an Associate Member of the Center of Membrane Sciences.

Professor Daunert received a Pharm.D. degree from the University of Barcelona, a M.S. in Medicinal Chemistry from the University of Michigan in 1985, and a Ph.D. in Bioanalytical Chemistry from the University of Barcelona in 1991. She has been a Fullbright Scholar, and has received among others the Juan Abelló Pascual Award in Biochemistry from the Spanish Royal Academy of Doctors, the Van Slyke Research Award from

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the American Association for Clinical Chemistry, a National Science Foundation-CAREER Award, a Cottrell-Scholars Award, and a Lilly Analytical Faculty Award. She is a member of the Editorial Advisory Boards of Fresenius' Journal of Analytical Chemistry, Talanta, and of the A-Page Panel of Analytical Chemistry. Dr. Daunert has served in several National Committees of the ACS, and is currently the Chair of the Education Committee of the Division of Analytical Chemistry of the ACS. Her research interests lie in the area of Bioanalytical Chemistry, at the interface between Analytical Chemistry and Molecular Biology. More specifically, her group employs recombinant DNA technology to design new assays and biosensors based on genetically engineered proteins and cells. An additional research focus of her group is in the design of sensing arrays for the detection of molecules in small volumes and microfluidic platforms. Dr. Daunert is the author/co-author of 100 original research publications and of several patents in the area of Bioanalytical Chemistry.

Division of Analytical Chemistry Award In Chemical Instrumentation. Sponsored by the Dow Chemical Company Foundation. Presented to: **Stanley R. Crouch**, Professor Emeritus at Michigan State University and an Adjunct Professor at Arizona State University.

Dr. Stanley R. Crouch did undergraduate work and received a M.S. degree in 1963 from Stanford University, working with Professor D. A. Skoog. His graduate work at the University of Illinois was with Professor H. V. Malmstadt culminating in a Ph.D. degree in 1967. Dr. Crouch was on the faculty at Michigan State University from 1968 until he retired in 2000. He was awarded an Alfred P. Sloan Foundation Fellowship from 1973-1975 and the 1996 ACS Division of Analytical Chemistry Award for Excellence in Teaching.

Professor Crouch's research interests have involved the study of the kinetics and mechanisms of analytical reactions as measured by flow injection techniques, laser spectroscopy, atomic emission, absorption and fluorescence methods. He has published nearly 150 papers in the areas of kinetic methods of analysis, flow analysis methods, computer-based chemical instrumentation, and analytical spectroscopy. Some 56 Ph. D. and 10 M.S. students received degrees working in his group at Michigan State University. Professor Crouch is the co-author of eight textbooks in the areas of "Analytical Chemistry", "Electronics and Instrumentation for Scientists" and "Spectrochemical Methods". He has held membership in the ACS, SAS, and AAAS, on the Instrumentation Advisory Panel of Analytical Chemistry, and the Editorial Advisory Boards of Anal. Chim. Acta, Talanta, and Instrumentation Science and Technology. He is currently living in Prescott, Arizona, while continuing to write textbooks and related technical materials.

Division of Analytical Chemistry Award In Electrochemistry. Presented to: **R. Mark Wightman**, the W. R. Kenan, Jr. Professor of Chemistry and a faculty member at the Neuroscience Center at the University of NorthCarolina at Chapel Hill.

R. Mark Wightman has been involved in electrochemical research for more than 30 years. Before graduate school he graduated from Erskine College, Due West, South Carolina, in 1968, and served for two years in the army. He was a graduate student in analytical chemistry at the University of North Carolina at Chapel Hill. In his graduate research under the direction of Royce Murray, he investigated the reaction pathways of radical anions. He received the Ph.D. degree in 1974. From 1974 to 1976 he was a postdoctoral associate in the Department of Chemistry, University of Kansas with R. N. Adams. During this stage he became interested in investigating neurochemical phenomena with electrochemistry. From 1976 to 1982 he was Assistant Professor of Chemistry, Indiana University, and was promoted Associate Professor in 1982 and Professor of Chemistry, in 1985. During this era, he and his groups were pioneers in the development and use of ultramicroelectrodes. He spent a six-month sabbatical at the London Hospital Medical College, University of London, in 1984. In this period he was able to show that carbon fiber microelectrodes could detect the neurotransmitter dopamine in the brain while it was interacting with neurons. In 1989 he joined the Department of Chemistry at the University of North Carolina at Chapel Hill where he was named the W. R. Kenan, Jr., Professor of Chemistry. He is also a faculty member in the Neurobiology Curriculum and the Neuroscience Center at the University of North Carolina at Chapel Hill. At UNC, Wightman's group developed methods for measuring small molecule secretion from single cells. In addition he and his group showed the advantages of ultramicroelectrodes for the generation of electrogenerated chemiluminescence.

Professor Wightman's research interests center around microelectrodes and their use to probe and understand complex chemical phenomena. He and his research group have demonstrated that ultramicroelectrodes enable electrochemical measurements on a submicrosecond time scale and in highly resistive media. These features have led to a number of applications such as electrochemistry in supercritical fluids, electrochemistry with low electrolyte, and the evaluation of the lifetime of highly unstable, electrogenerated radical anions and cations. Wightman and his group have developed methods that allow real time characterization of the chemical events during neuronal communication. In these applications microelectrodes are used to monitor individual small packets of molecules secreted from biological cells. In addition, the electrodes can be used as in vivo sensors of neurotransmission. His current research interests are in the area of electrogenerated chemiluminescence at microelectrodes, in vivo electrochemistry, and chemical monitoring of individual biological cells.

Division of Analytical Chemistry Award For Distinguished Service. Sponsored by Waters Corporation. Presented to: **Willie E. May**, Chief of the Analytical Chemistry Division at the National Institute of Standards and Technology.

Willie E. May received his B.S. degree in chemistry from Knoxville College, Knoxville, TN in 1968

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2001 Kolthoff Awardees

Christian Adams *Fort Lewis College*
Advisor: Dr. Kevin Mandernack
Chris Kuyper *Fort Lewis College*
Advisor: Dr. Robert Milofsky
Emily Hueske *U. of Texas at Austin*
Advisor: Dr. Allen Bard
Brittany Lee *University of Kansas*
Advisor: Dr. Cindy Larive
Lynley Hymas *Colorado State University*
Advisor: Dr. Ellen Fisher
Tania Magoon *Union College*
Advisor: Dr. Thomas C. Werner
Jolie Krance *California State University*
Advisor: Dr. Brett Stanley
Andrea Osisek *Shippensburg University*
Advisor: Dr. John Richardson
Kimberly Kutz *U. of Wis.-Whitewater*
Advisor: Dr. Baocheng Han

Kolthoff Awards

The Division of Analytical Chemistry of the American Chemical Society established the I. M. Kolthoff Enrichment Award to encourage talented chemistry undergraduate students to pursue further studies in Analytical Chemistry. The Award honors the late Professor of Analytical Chemistry at the University of Minnesota who was one of the leaders of the profession in the 20th century, author of numerous influential textbooks and a major researcher in electroanalytical chemistry. The award provides funding for undergraduate students to travel to an ACS National Meeting and to present the results of their research in the form of a poster at the Poster Session of the Division of Analytical Chemistry. Funds from the Kolthoff Award may be applied toward registration, travel, and accommodations. Only U.S. citizens and permanent residents are eligible. Preference will be given to those applicants who have not made a previous presentation at a National scientific meeting. Students who have received a prior award under this program are not eligible. Awards up to $500 will be made on the basis of both scientific merit and financial need.

Awards are given for travel to Spring meetings only. The deadline for receiving applications is the first Monday in November of the preceding year. The deadline for the Spring 2002 National meeting in Orlando is November 5th, 2001.

Visit the Division of Analytical Chemistry's webpage for I.M. Kolthoff Award information at www.acs-analytical.duq.edu/kolthoffaward.

Thea Barbarakis (DAC education committee & alternate councilor) & Chris Kuyper at the San Diego poster session

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and his Ph.D. in analytical chemistry from the University of Maryland at College Park, MD in 1977. He was employed at the Oak Ridge Gaseous Diffusion Plant from 1968-1971. He joined the National Bureau of Standards, as a Research Chemist, in 1971. He became Group Leader for Liquid Chromatography, Organic Analytical Research Division 1976 and became Chief of the Division in 1983. In 1994, Dr. May became Chief of the Analytical Chemistry Division (a combination of the Organic Analytical and Inorganic Analytical Chemistry Divisions

The Analytical Chemistry Division is one of five Divisions in the Chemical Science and Technology Laboratory, National Institute of Standards and Technology. Dr. May is responsible for policy development, planning, priority setting, fiscal allocation, staffing, and management of the day-to-day operations of the Division's approximately 100 scientists, technicians and administrative/clerical support staff. The Division has an annual budget of about $15M of which about $6M supports programs of other Federal and State Government Agencies and/or American Industry on a cost reimbursable basis.

The Division serves as the Nation's reference laboratory for chemical measurements and standards to enhance U.S. industry's productivity and competitiveness, assure equity in trade, and provide quality assurance for chemical measurements used for assessing and improving public health, safety, and the environment. The Division maintains world-class metrologically based core competencies in: Atomic and Molecular Spectroscopy, Chemical Sensing Technology, Classical and Electroanalytical Methods, Gas Metrology, Mass Spectrometry, Microanalytical Technologies, Nuclear Analytical Methods and Separation Science. These core competencies reside in five Groups: Spectrochemical Methods, Organic Analytical Methods Gas Metrology and Classical Methods Molecular Spectrometry and Microfluidic Methods and Nuclear Analytical Methods.

Dr. May's personal research activities were focussed in the area of trace organic analytical chemistry, with special emphasis on the development of liquid chromatographic methods for the determination of individual organic species in complex mixtures (i.e., extracts of environmental, food, and clinical samples) and the development of liquid chromatographic methods for the determination of physico-chemical properties such as aqueous solubilities, octanol/water partition coefficients, and vapor pressures of organic compounds. This work is described in more than 100 peer-reviewed publications. He has presented more than 150 invited lectures during his 30-year professional career at U.S. industrial sites, Colleges/Universities and Technical Meetings throughout the world.

Dr. May has several leadership responsibilities in addition to those at NIST. Currently he is Chair, Organic Analysis Working Group, Consultative Committee on the Quantity of Material, International Committee for Weights and Measures; Chair, Technical Committee, North American Metrology Cooperation; and Chair, Chemical Metrology Working Group, Interamerican System for Metrology. In the past he has served as President and Executive Board Member for the International Society for Polycyclic Aromatic Compounds; Chair, Physical Sciences Panel, Ford Foundation Predoctoral Fellowship Evaluation Board; Chair, Chemistry Panel, Texas Higher Education Coordinating Board, Chair, Chemical Metrology Subpanel, Institute for National Measurement Standards, Canadian National Research Council, and Chair, Committee on Minority Affairs, American Chemical Society.

Honors and Awards presented to Dr. May include: Department of Commerce Bronze, Silver and Gold Medals; National Institute of Standards and Technology Equal Employment Opportunity Award (1982 and 1993); Arthur S. Flemming Award for Outstanding Individual Performance in the Federal Government before the age of 40, Presidential Award for Senior Executive Service to the Federal Government; and the NOBCChE Percy L. Julian Award for Outstanding Research in Organic Analytical Chemistry.

Dr. May is married to Jeannie Tramble and is the proud father of Jeanniece Michele and Eric Jermaine May.

Subdivision of Chromatography

Subdivision Holds Elections for New Officers

The Sub-Division of Chromatography and Separations Chemistry will be holding an election for the office of Chair-Elect and for two members of the Executive Committee. Chair-Elect serves for two years then automatically succeeds to the Office of Chair. In conjunction with other members of the Executive Committee, one of the primary responsibilities of the Chair-Elect is to organize scientific programs at national ACS meetings. Victoria McGuffin of the Michigan State University Chemistry Department, East Lansing, MI is this year's candidate for Chair-Elect.

Executive Committee members serve for two years. Both officers and committee members are expected to participate in yearly sub-Division meetings, provide inputs to the program committee on sponsored symposia at local section, regional and national meetings, and generally work to increase the professional status and contact between scientists interested in chromatography and separations chemistry. This year there are four candidates for the two positions. They are: Brian Bidlingmeyer, Agilent Technologies, Wilmington, DE; Eric Erickson of Naval Air Warfare Center China Lake, CA; Jerry King of the U.S. Department of Agriculture, Peoria, IL; and Susan V. Olesik of the Ohio State University Chemistry Department, Columbus, OH.

Ballots will be in the mail to all Sub-Division members shortly.

Subdivision to Support National Meeting Technical Sessions

One of the roles of the Sub-Division is to sponsor and support chromatography-related technical sessions at National ACS Meetings. The upcoming Chicago (Fall, 2001) meeting will have a session entitled "Current HPLC Method Development Strategies" organized by Ken Norris of Pfizer, Groton, CT. The session will consist of seven papers on various aspects of HPLC method development including bioanalytical-, chiral-, and high speed- separations as well as detailed studies on pH effects and approaches to experimental optimization. The session is being sponsored by the Agrochemical Division and co-listed by the Sub-Division.

In the Spring, 2002, Orlando Meeting, Susan V. Olesik has agreed to organize a session on the separation of polymers. Susan is organizing a full day session with the morning focusing on fundamentals of separation mechanisms appropriate for polymers. Such topics as classical size-exclusion chromatography (SEC) using non-classical mobile phases such as supercritical- and subcritical-fluids and microSEC for sample-limited situations are planned. Both non-aqueous and aqueous SEC will be covered. In the afternoon, practical applications in characterizing polymers will be emphasized. Those who would like to make a contribution to this session are encouraged to contact Prof. Susan V. Olesik, Department of Chemistry, The Ohio State University, Columbus, OH 43210, phone 614-292-0733; e-mail: olesik@chemistry.ohio-state.edu.

Help Wanted!

Some current and past members of the executive committee of the Subdivision, who were present at the creation in 1984, would like to compile a history of the Subdivision. We would be grateful to receive any information that Analytical Division or Subdivision members may have about the latter's formative years, past activities, and so on. This information should be sent to John Nikelly, at the address below in the directory.

Subdivision Officer Directory

Chair
Richard A.Henry. Department of Chemistry. Penn State University.
152 Davey Lab
University Park, PA 16802
Phone 814-353-230
FAX 814-865-3314
e-mail: rhenry@psu.edu

Past Chair
Jon Parcher
Department of Chemistry
U. of Mississippi. Coulter Hall
University, MS 38677
Phone 601-232-5426
FAX 601-232-7300
e-mail: chjfp@olemiss.edu

Secretary
Ronald E. Majors
Agilent Technologies
2850 Centerville Road
Wilmington, DE 19808
Phone 302-633-8222
FAX 302-633-8908
e-mail: ron_majors@agilent.com

Executive Committee Members

Tom Chester
The Procter and Gamble Co.
Miami Valley Laboratories
P.O. Box 538707
Cincinnati, OH 45253-8707
Phone 513-627-2450
FAX 513-627-0655
e-mail: chester.tl@pg.com

John Dorsey
Department of Chemistry
The Florida State University
Tallahassee, FL 32306-4390
Phone 850-644-4496
FAX 850-645-5644
e-mail: Dorsey@chem.fsu.edu

Victoria McGuffin
Michigan State University
320 Chemistry Building
East Lansing, MI 48824
Phone 517-355-9715 ext. 244
FAX 517-353-1793
e-mail: jgshabus@aol.com

John Nikelly
University of the Sciences in Philadelphia
Department of Chemistry
600 South 43rd Street
Philadelphia, PA 19104
Phone 215-596-8848
FAX 215-895-1100
e-mail: j.nikell@usip.edu

Larry Taylor
Department of Chemistry
Virginia Polytechnic Institute and State University
Blacksburg, VA 24601
Phone 540-231-6680
FAX 540-231-3255
e-mail: ltaylor@vt.edu

DIVISION OF ANALYTICAL CHEMISTRY
AMERICAN CHEMICAL SOCIETY
1155 16th Street, NW
Washington, DC 20036

WE ARE ON THE WEB!

www.acs-analytical.duq.edu/analytical.html

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