



American Chemical Society Division of the History of Chemistry

Newsletter

238th ACS National Meeting Washington, DC August 16-20, 2009

S. C. Rasmussen, Program Chair

DIVISION OF THE HISTORY OF CHEMISTRY

Chair: Janan M. Hayes Merced College (retired) 6829 Barbara Lee Circle Sacramento, CA 95842 Phone: (916) 331-6886 Email: jmhayes@earthlink.net

Chair-Elect: E. Thomas Strom

Department of Chemistry and Biochemistry University of Texas at Arlington P. O. Box 19065 Arlington, TX 76019-0065 Phone: (817) 272-5441 Fax: (817) 272-3808 Email: tomstrom@juno.com

Past Chair: Roger A. Egolf

Pennsylvania State University -Lehigh Valley Campus 8380 Mohr Lane Fogelsville, PA 18051-9999 Phone: (610) 285-5110 Fax: (610) 285-5220 Email: rae4@psu.edu

Secretary-Treasurer: Vera V. Mainz

University of Illinois Urbana-Champaign School of Chemical Sciences 142B RAL, Box 34 Noyes Lab 600 S. Mathews Ave. Urbana, IL 61801 Phone: (217) 244-0564 Fax: (217) 244-8068 Email: mainz@uiuc.edu

Program Chair: Seth C. Rasmussen

Dept. of Chemistry and Molecular Biology North Dakota State University NDSU Dept. 2735, P.O Box 6050 Fargo, ND 58108-6050 Phone: (701) 231-8747 Fax: (701) 231-8831 Email: <u>seth.rasmussen@ndsu.edu</u>

Bulletin Editor: Paul R. Jones

University of Michigan Department of Chemistry Ann Arbor, MI 48109-1055 Fax: (734) 647-4865 Email: prjones@umich.edu

Councilor: Mary Virginia Orna

Department of Chemistry College of New Rochelle New Rochelle, NY 10805 Phone: (914) 654-5302 Fax: (914) 654-5387 Email: <u>mvorna@cnr.edu</u>

Councilor: Carmen Giunta

Le Moyne College 1419 Salt Springs Rd. Syracuse, NY 13214-1399 Phone: (315) 445-4128 Fax: (315) 445-4540 Email: giunta@lemoyne.edu

Alternate Councilor: James L. Marshall

Box 305070, Department of Chemistry University of North Texas Denton, TX 76203-5070 Phone; (940) 565-3377 Fax: (940) 565-4318 Email: jimm@unt.edu

Historian: James J. Bohning

Department of Chemistry, Lehigh University 6 E. Packer Ave., Bethlehem, PA 18015 Phone: (610) 758-3582 Fax: (610) 758-6536 Email: jjba@lehigh.edu

Archivist: John Sharkey

Pace University Department of Chemistry & Physical Sciences One Pace Plaza New York, NY 10038-1502 Phone: (610) 758-3582 Email: jsharkey@pace.edu

Mission Statement

The Division of the History of Chemistry (<u>HIST</u> - <u>http://www.scs.uiuc.edu/~mainzv/HIST/</u>) of the American Chemical Society (ACS) seeks to advance knowledge and appreciation of the history of the chemical sciences among chemists, students, historians of science, and the broader public by

- Encouraging research and scholarship in history of the chemical sciences;
- Providing a welcoming environment for the discussion of history of chemistry in a variety of venues, particularly in symposia at national ACS meetings;
- Serving as a resource for chemical scientists in general, and members of the ACS in particular, who seek to understand the roots of their discipline, sub-discipline, or interdisciplinary subject;
- Recognizing major achievements from the past in the chemical sciences and the individuals who made those achievements;
- Publishing a scholarly journal in history of chemistry;
- Interacting with other organizations interested in the history of science; and
- Adding value to the ACS by helping it achieve its vision and missions.

Message from Jan Hayes, HIST Division Chair

It is hard to believe that we are already six months into my responsibilities as chair of HIST. It has been a busy time with a low and a number of highs. First the low, the passing of Jack Stocker, HIST's

jolly good fellow, chief jokester, grand cheerleader, and true chemical historian. The HIST scene at national ACS meetings will be very different without Jack's presence. To honor Jack, HIST will have a special symposium at the Spring 2010 meeting in San Francisco. Although we will invite some speakers, I would encourage any of you who desire to present a paper, a remembrance, a story to contact me so we can get title, abstract, time – all of those official issues. In addition, I plan to have an "open mike" session at the end of the symposium for those who want to just add a few comments.

Now for the highs. Your Executive Committee has been working steadily to shape the future of HIST within the current professional and economic environment. First, we have finalized and formalized our association with



CHF. We are still working, with Roger Egolf as our representative, to best frame this relationship. But it is important for both HIST and CHF that we complement, not duplicate, our mutual efforts to support the progress of chemical history. It should be noted that Jack Stocker has been since the beginning an official ACS representative to the CHF group. ACS has not indicated yet who will take his place, but he was also a great HIST influence on CHF in that position.

Second, we are taking a detailed look at the funding of on-going programs and awards of HIST. This is far from completed but we are moving forward. Stay tuned for more in the future.

Third, Seth Rasmussen is to be congratulated in the first two programs that he has arranged for Salt Lake City and for Washington DC. And from the look of future meetings, he has taken a strong yet creative approach to our National Meetings programming. One area the Division of History needs to improve is our programming at Regional Meetings. We need YOUR help. Every year there are seven to ten regional meetings. Think of your interests, think of your area, look at the schedule of regional meetings and help us bring more HIST programming to the regions.

Fourth, we are working for further coordination of our activities with other Divisions and organizations. Joe Jeffers is our contact person for working with the Divisional Activities Committee in looking at long range and thematic programming. As our former program chair, he does understand our interests and our abilities. But again, we need you to step forward to help expand the range and diversity of our programming.

Fifth, one area we have been active in, but not yet heard the result, is in the activities concerning the plans of the State of Pennsylvania to close the Joseph Priestley home as a museum and educational site. Many of you responded with LAN responses, with letters, with comments. Thank you to all of those who responded so rapidly. I still do not know the outcome, but this will certainly be an on-going concern.

Finally, we on the Executive Committee need to hear from YOU. In our strategic planning we realize that there are many diverse interests and skills/talents within the HIST membership. For many of us, HIST involvement has come with retirement from other professional activities be they research or job-related. So we need to address the problem of developing an awareness of and need for HIST in others, such as current high school and community college teachers, university and four-year college professors, students in the areas of History of Chemistry/Science and Chemical Education, as well as the general public. Please send me your ideas at jmhayes@earthlink.net. Sending an idea does not mean I will ask you to carry out the plan, but you would be welcome to participate.

Again, thank you for honoring me with being selected as your 2009-2010 HIST Chair. Please let me know, as many of you have already, how I can make HIST a more prominent and productive part of the ACS.

Jan Hayes, 2009/2010 HIST Chair

Report of Councilors, Division of the History of Chemistry ACS National Meeting, Salt Lake City, UT, March 25, 2009

Election Results

- The Committee on Nominations and Elections presented to the Council the following nominees for selection as candidates for President-Elect, 2010: Berkeley W. Cue, Jr., Nancy B. Jackson, Cheryl A. Martin, and Dorothy J. Phillips. By electronic ballot, the Council selected Nancy B. Jackson and Cheryl A. Martin as candidates for 2010 President-Elect. These two candidates, along with any candidates selected via petitions, will stand for election in the Fall National Election.
- The Committee on Nominations and Elections announced the results of the election to select candidates from the list of nominees to represent District I and District V on the Board of Directors for the term 2010-2012. Nominees for District I included: D. Richard Cobb, Neil D. Jespersen, Wayne E. Jones, and James L. Kallmerten. Nominees for District V included Thomas J. Barton, Judith L. Benham, Peter K. Dorhout, and John W. Moore. By mail ballot, the Councilors from these districts selected D. Richard Cobb and Neil D. Jespersen as District I candidates; and as District V candidates, Judith L. Benham and Peter K. Dorhout. Ballots will be mailed on or before October 10 to all members in District I and District V for election of a Director from each District.

Candidates for Directors-at-Large

• The Committee on Nominations and Elections announced the selection of the following candidates for Directors-at-Large for a 2010-2012 term: Dennis Chamot, H. N. Cheng, Ray A. Dickie, and Valerie J. Kuck. The election of two Directors-at-Large will be conducted in the fall. Ballots will be mailed to the Council on or before October 10.

Committee Elections

- The Committee on Nominations and Elections presented Roger F. Bartholomew and Roland F. Hirsch to Council as candidates for election to the Committee on Committees (ConC) to fill a vacancy created by a committee member's resignation. By written ballot, the Council elected Roland F. Hirsch.
- Candidates Carol B. Libby and Robert A. Pribush were presented to Council for election to the Committee on Nominations and Elections (N&E) to fill a vacancy created by a committee member's resignation. By written ballot, the Council elected Robert A. Pribush.

Petition to Amend Bylaws (For Consideration)

• The Council received one petition for consideration: the Petition on Election Timelines 2009. According to the proposing committee, this petition presents election procedure refinements that are intended to provide a fair, consistent, and equitable process, which balances the concerns and needs of participants, as requested by Councilors and candidates. Action is expected on the petition at the fall Council meeting.

Change in Committee Charge

• The Council VOTED to permit the Committee on Chemistry and Public Affairs to amend a portion of its charge from: "a. Identify and analyze legislative, regulatory, research and other science policy issues that impact upon the chemical sciences and technologies" to "a. Identify and analyze legislative; regulatory; research; Science, Technology, Engineering, and Math (STEM) education funding; and other science policy issues that impact upon the chemical sciences and technologies."

The Society's Finances

• The Council and Board of Directors received extensive briefings on the Society's finances, which showed that in spite of the economic challenges faced in 2008, the Society's operating performance held up well. Total revenue was approximately \$450 million, up just over 3% from 2007. The Society's Net from Operations was \$9.7 million, and \$560,000 favorable to budget. This is the fifth consecutive year of positive operating results.

However, in 2008 ACS was adversely impacted by the historic collapse in the capital markets, which resulted in a sharp decline in the Society's unrestricted net assets from \$212 million at December 31, 2007, to \$60 million at December 31, 2008. There were two factors driving this decrease, both related to the poor performance in the capital markets. These are substantial investment losses and a sizable increase in pension liability from the Society's Defined Benefit Pension Plan. For this and other reasons, action was taken in 2007 to close the Defined Benefit Pension Plan, and, in 2008, to freeze benefit accruals for all Defined Benefit Pension Plan participants in 2009.

It is in this context that the Board received a detailed briefing from management at this meeting on the framework of the 2009 Contingency Plan. In 2006, the Society had the foresight to develop a robust Contingency Plan that contemplated potential threats from many different sources, their probability of occurrence, likely duration and financial impact. The updated 2009 Plan covers all operating and administrative units as well as member programs, and identifies new and emerging threats. ACS management has also updated the mitigation strategies to respond to the threats and ensure the Society's long-term financial sustainability. Society management and the Board of Directors are closely monitoring financial performance versus the budget. In addition, significant reductions in discretionary spending have already been implemented and additional cost control measures are under consideration. However, despite the adverse impact of the economic downturn, the Society remains highly liquid with more than \$275 million in cash and investments, and limited debt of \$30 million.

2010 Member Dues

• After a lengthy discussion and rejection of two amendments, the Council VOTED to set the member dues for 2010 at the fully escalated rate of \$145. This rate is established pursuant to an inflation-adjustment formula in the ACS Constitution and Bylaws. The vote was 348 to 70.

Member Statistics

• At the close of 2008, Society membership totaled 154,024, compared to 160,052 for year-end 2007. In 2008, ACS completed the transition of its 15 year-old membership fulfillment system to a new, more robust system. The year-end 2008 membership numbers reflect a drop in membership of approximately 2% due to the economy and a correction to the counts of 2,589 Emeritus members whom ACS has not been able to reach for many years. Compared to its sister societies, ACS experienced a smaller loss of members in 2008.

Special Discussion Item

• A special discussion item was again put on the Council agenda for this meeting. ACS President Thomas H. Lane invited the Chair of the Committee on Membership Affairs to present the results of a Councilor survey as a preface to the discussion on what can ACS do to attract new members while better serving our membership during these challenging economic times. Following the presentation, President Lane led Councilors in a lively discussion that focused on the value of ACS membership and on growth opportunities among students, international scientists, high school teachers, technicians, diverse ethnic groups and others.

Attendance Report

• As of March 25, 2009, the ACS spring national meeting had attracted 10,668 registrants: Regular attendees 5,781; Students 3,439; Exhibitors 780; Exposition only 411; and Guests 257.

Professional Employment Guidelines

• The Council VOTED to approve the Professional Employment Guidelines, as submitted by the Committee on Economic and Professional Affairs. These guidelines offer a broad spectrum of recommended practices in employment for professional scientists and their employers.

Committee Actions

• The Board received reports from its Executive Committee, Committees on Grants and Awards (G&A), Committee on Planning, and the Committee on Professional and Member Relations (P&MR). On the recommendation of the Committee on Grants and Awards, the Board VOTED to delegate oversight authority for the new ACS Fellows Program to G&A. G&A also presented the Board with a screened list of nominees for the 2010 Priestley Medal and the Volunteer Service Award. The Board VOTED to accept the committee's lists and agreed to announce the winners of the 2010 Priestley Medal and the Volunteer Service Award after its June meeting. On the recommendation of the Committee on Professional and Member Relations, the Board VOTED to amend its Regulations to reflect P&MR's responsibility to review and approve requests for international alliances under delegated authority from the Board. The Board also VOTED to

eliminate the requirement that an individual have a Pubs/CAS subscription authentication in order to be eligible for participation in the Network as an ACS global partner.

The Executive Director/CEO Report

• The Executive Director/CEO, along with several of her direct reports, updated the Board on the activities of Chemical Abstracts Service, the Publications Division, and the Society's General Counsel. The Board VOTED to approve a co-editor appointment and two reappointments of journal editors.

Compensation of Society Staff

• On the recommendation of the Committee on Executive Compensation, the Board VOTED to approve several actions relative to compensation for the Society's executive staff. The compensation of the Society's executive staff receives regular review from the Board.

Other Society Issues

• The Board was briefed by its working group monitoring the 2009 Plan for Continuous Improvement. This plan, which currently includes four broad topic areas and subtopics, is designed to enhance overall Board effectiveness.

Activities of HIST Councilors

Carmen Giunta – serves as a member of the Divisional Activities Committee and its subcommittee on Constitution and Bylaws, liaison to the Committee on Constitution and Bylaws, and member of the Committee on Nomenclature, Symbols, and Terminology. He participated in meetings of all three groups in Salt Lake City.

Mary Virginia Orna – continues her service (2nd year of a three-year term) on the Council Policy Committee (CPC); she is also a member of the CPC Subcommittee on Long-Range Planning and the Subcommittee on Constitutions and Bylaws. She participated in the newly-established new Councilor Orientation Program at the Salt Lake City meeting where she gave suggestions to the plenary group on ways to report to one's Division as a Division Councilor.

Many of the matters discussed and reported in governance meetings at Salt Lake City are of interest to ACS members in general, such as the Fellows program discussion of recruitment and retention of members. We did not note any matters that were specifically pertinent to the interests of HIST members in particular.

Carmen Giunta, Mary Virginia Orna, Councilors

Bulletin for the History of Chemistry

Members of HIST receive the Bulletin as part of their annual dues, which financially support its publication. It appears semiannually, in February and September. Volume 34, Numbers 1 and 2 come out in 2009. With completion of Volume 35 in 2010, we will publish cumulative author and subject indexes, something we do every 5 years. Extra copies may be ordered through Vera Mainz, HIST Secretary/Treasurer, at \$20 each. All back issues are available at the same rate. Electronic copies of individual articles from all back issues are also available to HIST members through the Division website. About 70 academic libraries hold subscriptions to the Bulletin. If your library lacks a subscription, you should encourage your acquisitions librarian to consider one of the best bargains in periodicals. We are always seeking new reviewers of manuscripts and recent books. If you are interested, please let me know. You are encouraged to submit mss. on history of chemistry at any time. *Paul R. Jones (prjones@umich.edu), Editor*

Message from the HIST Program Chair

This is the first in hopefully a series of discussions with the HIST membership about our ongoing efforts in programming within the HIST division. I will start with a few requests and then talk about some new ideas. First of all, while we have had some great recent symposia, the numbers of presentations in the General Papers sessions have been dropping. This was evident in our Salt Lake session that only had three papers. Please consider presenting at the upcoming meetings in San Francisco (March 2010) and Boston (August 2010). While the numbers are back up for the current meeting in Washington, DC, we need try to maintain a greater number of general papers in order to guarantee strong programming within these sessions. I would also like to present a general request that ALL presenters consider presenting in SciMix when submitting abstracts for the national meetings. Unfortunately, we had no HIST representation at SciMix for Salt Lake. While I understand that presenting in SciMix requires HIST speakers to prepare a poster as well as the oral talk, this is the BEST way to share our joy of history with the rest of the ACS community, many of which unfortunately don't know that we exist. I would like to be able to fill all of our SciMix slots and show off what we are doing in HIST.

Now on to new ideas. The first is the thought of small HIST poster sessions/mixers at the national meetings. I don't want these sessions to replace any of our oral sessions, but envision this as a medium for members to present either ongoing projects that do not fit into a standard HIST talk or a smaller project that lacks the content for a longer talk. Many divisions use posters to present information in its earlier stages before it is complete enough for a talk, and perhaps this could be a way for people new to HIST to present initial work, while getting advice and guidance from the more established community. This could also be an excellent forum for students to contribute to HIST programming.

Next, I would like to start a new ongoing program entitled "Historical Tutorials" which would act as a service to both HIST members and the ACS membership as a whole. Rather than new historical research, these tutorials would be presented by HIST members and cover important topics in chemical history as a primer in the subject. I am currently thinking of 1-2 such tutorial talks as part of the general papers session and will be looking for both potential topics and speakers as I continue to talk to the members of HIST at upcoming meetings.

Lastly, in another effort to increase student involvement in HIST, we will be organizing an 'Undergraduate Symposium in the History of Chemistry' for the San Francisco national meeting. However, to make this work, we need HIST members to mentor students on history projects and encourage them to participate. This is a great way for us to build the next generation of HIST members! Please feel free to share your thoughts and suggestions (seth.rasmussen@ndsu.edu) and if you have questions about potential talks or symposia, please don't hesitate to contact me. *Seth C. Rasmussen, HIST Program Chair*

HIST Symposia, 238th ACS Meeting in Washington, DC August 16-20, 2009

Schedules and abstracts are listed at the end of this Newsletter.

Classic Books in Chemistry VI: The Language of Chemistry

Cosponsored by Bolton Society and CINF This day long symposium will include 9 talks covering various aspects of nomenclature, symbolism, and communication in chemistry. The symposium will be **Sunday morning and afternoon**, August 16, in the Washington Plaza, Franklin Room. *Ned D. Heindel and Jim J. Bohning, Organizers*

The Heritage of Chemistry: A Symposium to Honor Arnold Thackray

A day-long symposium will be held to honor Arnold Thackray's retirement from the Chemical Heritage Foundation and his upcoming 70^{th} birthday. A number of distinguished individuals who have each played an important role in his life – according to Arnold (!) – will participate. The topics of the lectures will range from reports of research in the history of chemistry to personal reminiscences of times with Arnold Thackray and the early days of the CHF. The symposium will be **Monday morning and afternoon**, August 17, in the Washington Plaza, Franklin Room.

Jeff I. Seeman, Organizer

Edelstein Award Symposium Honoring Trevor Levere

Trevor Levere, currently professor emeritus at the University of Toronto's Institute for the History and Philosophy of Science and Technology, has been a leading historian of chemistry for 40 years (his undergraduate thesis on Martinus van Marum was published in 1969). His research in apparatus, institutions, social context, experimentation and theory construction have appeared in numerous books and articles. His 2002 book Transforming Matter: a History of Chemistry from Alchemy to the Buckyball is one of the very best short histories of chemistry accessible to a wide audience. The Edelstein Award Symposium promises to be a happy gathering of Trevor's friends and colleagues centered around a sequence of historical papers that cover topics from the 17th to the 19th centuries. The opening acts have William Newman on the influence of chemical analysis and synthesis on Newton's theory of light and colors, Victor Boantza on the nature of matter and chemical analysis at the early Académie des Sciences, Alan Rocke on visual imagination in 19th century chemistry and Mel Usselman on William Hyde Wollaston's marketing of chemistry in the early 19th century. The main feature will be Trevor himself analyzing experimental accuracy in chemists from Joseph Black to Michael Faraday, with closing remarks by Sy Mauskopf. The symposium will be of interest to everyone who wishes to learn more of the formative years of chemistry and to those who wish to congratulate Trevor Levere for his remarkable and extensive contributions to our understanding of 'the central science'. The symposium will be **Tuesday afternoon**, August 18, in the Washington Plaza, Franklin Room.

Mel Usselman, Organizer

HIST Cosponsored Events

Best Practices of Starting a Chemical Business From Last Century that Remain Valuable Today [Sponsored by SCHB, Cosponsored by HIST] *Joseph E. Sabol, Organizer*

Handbooks: Past, Present, and Future

[Sponsored by CINF, Cosponsored by HIST] *Grace A. Baysinger, Organizer*

UPCOMING NATIONAL MEETINGS AND HIST DEADLINE

Offerings are subject to change. Check the <u>HIST website</u> - <u>http://www.scs.uiuc.edu/~mainzv/HIST/</u> for updates.

SAN FRANCISCO, March 21-25, 2009

Submit your abstract via the ACS Electronic Submission System (<u>OASYS</u> - <u>http://oasys.acs.org/oasys.htm</u>) by **October 26, 2009**. If you do not have access to a computer for use in the submission, contact Seth Rasmussen. Check the call for papers in <u>Chemical and Engineering</u> <u>News</u> - <u>http://pubs.acs.org/cen/</u> or the <u>ACS website</u> - <u>http://portal.acs.org/portal/acs/corg/content</u> for changes in the abstract deadlines. Symposia ideas are still being accepted.

General Papers. (Seeking contributors) Seth C. Rasmussen, Department of Chemistry and Molecular Biology, North Dakota State University, Fargo, ND 58105, Phone: (701) 231-8747, Email: seth.rasmussen@ndsu.edu

100+ Years of Plastics: Leo Baekeland and Beyond. (Seeking contributors) E. Thomas Strom, Department of Chemistry and Biochemistry, University of Texas at Arlington, P. O. Box 19065, Arlington, TX 76019-0065, Phone: (817) 272-5441, Fax: (817) 272-3808, Email: tomstrom@juno.com

Undergraduate Symposium in the History of Chemistry. (Seeking contributors) Seth C. Rasmussen, Department of Chemistry and Molecular Biology, North Dakota State University, Fargo, ND 58105, Phone: (701) 231-8747, Email: seth.rasmussen@ndsu.edu

BOSTON, August 22-26, 2010

General Papers. (Seeking contributors) Seth C. Rasmussen, Department of Chemistry and Molecular Biology, North Dakota State University, Fargo, ND 58105, Phone: (701) 231-8747, Email: seth.rasmussen@ndsu.edu

Busted - Myths of a Chemical Nature (Invited and seeking contributors) Vera V. Mainz, University of Illinois Urbana-Champaign, School of Chemical Sciences, 142B RAL, Box 34 Noyes Lab, 600 S. Mathews Ave, Urbana, IL 61801; Phone: (217) 244-0564; Fax: (217) 244-8068; Email: mainz@uiuc.edu

Women Chemists and Scientists You Know, or If You Don't Know You Ought to Know Them

(Invited and seeking contributors) [co-sponsor: WCC] Janan M. Hayes, Merced College (retired), 6829 Barbara Lee Circle, Sacramento, CA 95842; Phone: (916) 331-6886; Email: jmhayes@earthlink.net.

News from the Chemical Heritage Foundation

The <u>Chemical Heritage Foundation</u> - <u>http://www.chemheritage.org/</u> (CHF) serves the community of the chemical and molecular sciences, and the wider public, by treasuring the past, educating the present, and inspiring the future. CHF maintains a world-class collection of materials that document the history and heritage of the chemical and molecular sciences, technologies, and industries; encourages research in its collections; and carries out a program of outreach and interpretation in order

to advance an understanding of the role of the chemical and molecular sciences, technologies, and industries in shaping society.

Oliver Smithies Receives 2009 American Institute of Chemists (AIC) Gold Medal

Oliver Smithies, Excellence Professor in the Department of Pathology at the University of North Carolina Chapel Hill and recipient of the 2007 Nobel Prize in Physiology or Medicine, received the 2009 AIC Gold Medal. The AIC Gold Medal was presented at the Chemical Heritage Foundation in an afternoon ceremony during Heritage Day on Thursday, 14 May 2009. Heritage Day is CHF's annual celebration of achievement and promise in the chemical and molecular sciences.

Oliver Smithies was born in 1925 in Yorkshire, England. He won a scholarship to Oxford University, where he earned a B.A. with first-class honors in physiology in 1946 and a Ph.D. in biochemistry in 1951. As a researcher working at the Connaught Medical Research Laboratories of the University of Toronto between 1953 and 1960, Smithies greatly improved gel electrophoresis, a process of separating proteins to identify genes, by using starch. His innovation simplified the procedure and became a standard practice in laboratories and helped to earn him the 2007 Nobel Prize in Physiology or Medicine. In 1960 Smithies joined the laboratory of genetics at the University of Wisconsin-Madison. It was there that he made groundbreaking discoveries concerning embryonic stem cells and DNA recombination in mammals, which led to the creation of gene targeting, an immensely powerful technology now applied to virtually all areas of biomedicine. His laboratory was also the first to develop mouse models for such diseases as cystic fibrosis, thalassemia, hypertension, and atherosclerosis. In 1988 Smithies became the Excellence Professor of Pathology and Laboratory Medicine at the University of North Carolina at Chapel Hill.