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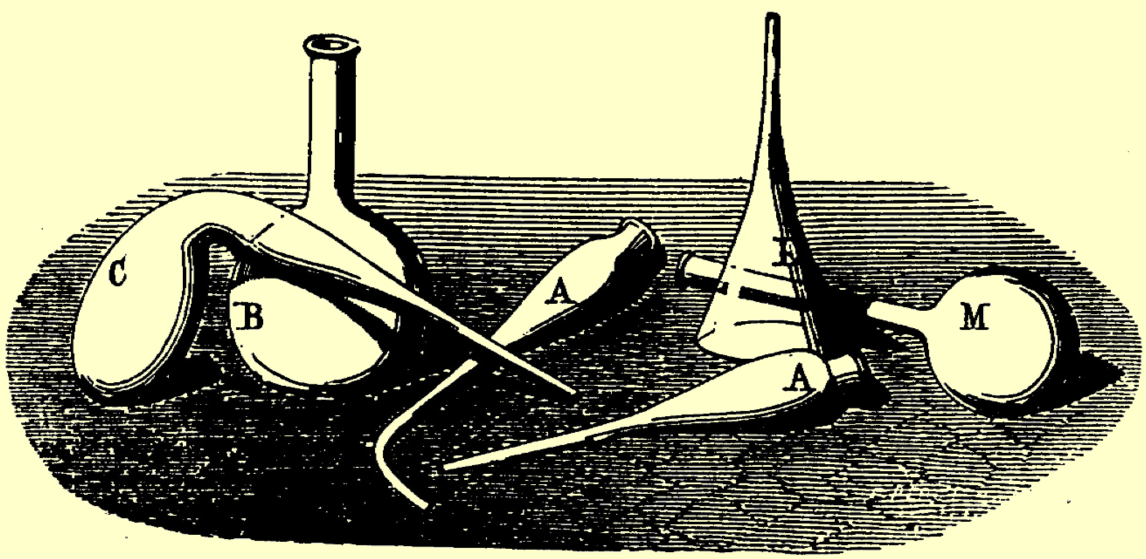
DIVISION OF THE HISTORY OF CHEMISTRY



PROGRAM & ABSTRACTS

250th ACS National Meeting
Boston, MA
August 16-20, 2015

S. C. Rasmussen, Program Chair

Final Program
HIST

DIVISION OF THE HISTORY OF CHEMISTRY

S. C. Rasmussen, *Program Chair*

SUNDAY AFTERNOON

Section A

Boston Convention & Exhibition Center - Room 50

1:30 - 2:00 HIST Business Meeting

Edwin Land and Instant Photography: Massachusetts' First National Historic Chemical Landmark

Cosponsored by PRES

J. L. Maclachlan, M. Filosa, V. Walworth, *Organizers*
J. N. Driscoll, *Organizer, Presiding*

2:00 1. What does it take to start chemical manufacturing from scratch? **W Hollinsed**

2:30 Panel Discussion

SUNDAY EVENING

Boston Convention & Exhibition Center - Room 109B

5:00 - 8:00 HIST Executive Committee Meeting

MONDAY MORNING

Section A

Boston Convention & Exhibition Center - Room 50

Memories of Henry Hill: His Legacy in Science and in Professional Service

Cosponsored by AGRO, CARB, COLL, ENFL, POLY, PRES, PROF and SCHB

J. Hayes, *Organizer*, *Presiding*

8:30 Introductory Remarks.

8:40 2. Dr. Henry Hill, ACS President 1977: Firsts and leading lights. **Janan Hayes**

9:05 3. Henry Hill's entrepreneurial beginnings. **Arthur S. Obermayer**

9:35 4. A Shared Responsibility: Diversity and inclusion at ACS. **Joy Titus-Young**

10:05 Intermission.

10:25 5. Henry Hill: My forerunner as ACS President. **Joseph S. Francisco**

10:45 6. Henry Hill: An ACS pioneer. **Attila E. Pavlath**

11:15 7. The legacy of Henry Hill as viewed by a member of the Northeastern ACS Local Section. **Dorothy J. Phillips**

11:40 Panel Discussion.

MONDAY AFTERNOON

Section A

Boston Convention & Exhibition Center - Room 50

General Papers

S. C. Rasmussen, *Organizer*, *Presiding*

1:00 8. Science anniversaries 2015: A philatelic celebration. **Daniel Rabinovich**

1:30 9. Learning the principles of organic chemistry in context using the historical development of this science. **Mark M. Green**

2:00 11. Autograph books of Tetsuo Nozoe: July 19, 1953 to October 16, 1994. **Jeffrey Seeman**

2:30 Intermission.

2:45 12. From the history of stereochemistry: Louis Pasteur's language for molecular chirality. **Joseph Gal**

3:15 13. Legacy of British biochemist Frederick Sanger. **Joe S. Jeffers**

3:45 14. Karl Karlovich Klaus (1796-1864): Discoverer of ruthenium. **David E. Lewis**

4:15 15. Early history of polyaniline: Discovery and origins. **Seth C. Rasmussen**

MONDAY EVENING

Section A

Boston Convention & Exhibition Center - Room 50

Sci-Mix

S. C. Rasmussen, *Organizer*

8:00 - 10:00

9, 13, 14. See previous listings.

16. 100 years of service to chemistry in Virginia. **Ann M. Sullivan**, Kristine S. Smetana, Linette M. Watkins, Janet A. Asper, Joseph M. Crockett

17. Aspirin: Incorporating the history of chemistry in the community college classroom. **Gita Perkins**

18. Edwin Land and instant photography: An ACS National Historic Chemical Landmark. **Jennifer L. Maclachlan**, John N. Driscoll

TUESDAY MORNING

Section A

Boston Convention & Exhibition Center - Room 205A

Fifty Years of Innovation: The Legacy of the Westheimer Report

MPPG, Cosponsored by HIST

R. Egolf, *Organizer*, *Presiding*

8:35 Introductory Remarks.

8:45 MPPG 16. Opportunities and needs: The Westheimer view of chemistry in the 1960's and beyond. **Roger Egolf**

9:15 MPPG 17. Innovation in condensed matter chemistry. **Gary Patterson**

9:45 MPPG 18. Medicinal chemistry in and after the Westheimer report: Recommendations and ripples. **Ned Heindel and P. S. Anderson**

10:15 Intermission.

10:30 MPPG 19. Fifty years of computational chemistry. **Kendall Houk**

11:00 MPPG 20. Bridging the divide: A tale of the merger of computational chemistry and structural biology in enzyme design. **Stephan Mayo**

11:30 MPPG 21. The Breslow-Tirrell Report. **Ronald Breslow**

TUESDAY AFTERNOON

Section A

Boston Convention & Exhibition Center - Room 50

HIST Award Symposium Honoring Christoph Meinel

G. D. Patterson, *Organizer*
A. J. Rocke, *Organizer*, *Presiding*

1:00 19. Quiet revolution revisited: Theory vs. practice in nineteenth-century German chemistry. **Alan J. Rocke**

1:30 20. Tale of three generations: Interactions between historical context and disciplinary development among German chemists, 1871-1945. **Jeffrey A. Johnson**

2:00 21. Mixed messages: Divergent motives and frontier science at the Hickrill Chemical Research Laboratory. **Stephen J. Weininger**

2:30 22. John Tyndall and chemical physics. **William Brock**

3:00 Intermission.

3:15 23. History and philosophy as an emergency exit? The case of Maurice Delacre (1862-1938). **Brigitte van Tiggelen**

3:45 24. History of recent chemistry: New wine in old flasks?. **Carsten Reinhardt**

4:15 25. How science historians helped create chemistry as a discipline. **Christoph Meinel**

ABSTRACTS

HIST 1 - What does it take to start chemical manufacturing from scratch?

W Hollinsed[1], *chollinsed@gmail.com, [1]StormRider Technologies, Washington, DC, District of Columbia, United States*

In the BC days (before computers and digital photography), Polaroid Corporation developed a system for single step photography. The entire system was based on new chemistry and coating technologies that had never existed before. Why were new chemicals needed and what were the performance criteria? Why and how did Polaroid get into the chemical manufacturing business and what were the results? What was the impact of Ed Land's culture on this operation? How did the chemical development operation learn to do rapid and high quality scale-up to manufacturing as a core skill? What did we all learn from this and take with us to other places in the industry? A series of illustrative anecdotes will be discussed highlighting the skills developed at Polaroid as well as the limitations resulting from not being a legacy chemical enterprise.

HIST 2 - Dr. Henry Hill, ACS President 1977: Firsts and leading lights

Janan Hayes[1], *jmhayesacs@gmail.com, [1]Project Inclusion, Sacramento, California, United States*

Dr. Henry Hill was a leader in the ACS and in his professional activities in many ways. As an introduction to this symposium in his honor, this paper will provide an overview to his activities, successes, and honors.

HIST 3 - Henry Hill's entrepreneurial beginnings

Arthur Obermayer[1], *obermayer@alum.mit.edu, [1]Moleculon Res Co, West Newton, Massachusetts, United States*

Four months after founding Moleculon, I met Henry Hill at an ACS meeting. He was thinking of starting Riverside Research Laboratory. I invited him to join us since we had a facility and staff that could be shared. The rest is the story of this talk.

HIST 4 - A Shared Responsibility: Diversity and inclusion at ACS

Joy Titus-Young[1], *j_titus-young@acs.org, [1]American Chemical Society, Washington, District of Columbia, United States*

Joy Titus-Young is the manager of Diversity Programs at the American Chemical Society. In her current capacity, she provides operational leadership to ACS programs, activities, and partnerships related to diversity and inclusion. In addition, she serves as the staff liaison to the Diversity and Inclusion Advisory Board and the Committee on Minority Affairs.

The ACS Department of Diversity Programs' (DDP) mission is to advance diversity and inclusion in the chemical sciences. The department focuses on increasing the representation and inclusion of underrepresented minorities, women, younger chemists, chemists with disabilities, and LGBTQ+ in the chemical sciences. In addition, the department works to increase the diversity of ACS membership, educate members and stakeholders on the value and status of diversity, and recognize and communicate outstanding diversity achievements.

HIST 5 - Henry Hill: My forerunner as ACS President

Joseph Francisco[1], *francisc@purdue.edu, [1]Purdue Univ Chem Dept, West Lafayette, Indiana, United States*

As the 2010 ACS President, my presidency was built both on my own interests and experiences and on the history of activities of previous past presidents. Henry Hill represents a significant past president in establishing the framework for my plans and programs.

HIST 6 - Henry Hill: An ACS pioneer

***Attila Pavlath*[1]**, *attilapavlath@yahoo.com, [1]WRRC, Albany, California, United States*

For many years the American Chemical Society lived on its past outstanding accomplishments since its foundation in 1876. Even though time has changed, somehow the ACS leadership was reluctant to make changes either because they did not feel that any change was needed or that they were not sure about the road to be taken. The early pioneers who wanted to expand our country to unchartered areas were guided by the Shakespearean principle: 'Our doubts are traitors, and make us lose the good, we oft might win, by fearing to attempt". That was Henry Hill's philosophy both in his private and ACS activities. He was not afraid to speak up. As a Board member and ACS President he was openly promoting the need for changes within the Society. He faced various subtle and open oppositions on his road to bring the Society into the 20th century. However, as a true pioneer he kept going without fear. Unfortunately, his early death did not allow him to see the fruit of his work, but his contributions never will be forgotten.

HIST 7 - The legacy of Henry Hill as viewed by a member of the Northeastern ACS Local Section

***Dorothy Phillips*[1]**, *dwphillips@comcast.net, [1]ACS Board of Directors, Natick, Massachusetts, United States*

This paper represents the observations of an active member of the Northeast Local Section, Henry Hill's home section on his impact both on the section and on the individual chemists in this region. In addition the author will share some of her personal responses to the legacy of Dr. Henry Hill.

HIST 8 - Science anniversaries 2015: A philatelic celebration

***Daniel Rabinovich*[1]**, *drabinov@uncc.edu, [1]UNC Charlotte Chemistry, Charlotte, North Carolina, United States*

The year 2015 marks several important milestones in the history of science, including the bicentennial of Humphry Davy's development of a miner's safety lamp and the 150th anniversary of August Kekulé's proposal for the hexagonal structure of benzene. Postage stamps, which are often used as a simple yet effective means of communication to inform the general public about a variety of subjects and events, will be used in this presentation to illustrate the history of these discoveries. In a similar vein, postage stamps and other philatelic materials will be shown to commemorate the centennial of the Nobel Prize in Chemistry awarded to Richard Willstätter "for his researches on plant pigments, especially chlorophyll" and the Nobel Prize in Physics awarded jointly to Sir William Henry Bragg and his son William Lawrence Bragg "for their services in the analysis of crystal structure by means of X-rays". The presentation will conclude with an overview of the stamps issued in recent months to celebrate the International Year of Light and Light-based Technologies (IYL 2015), some of which have unexpected connections to chemistry.

HIST 9 - Learning the principles of organic chemistry in context using the historical development of this science

***Mark Green*[1]**, *mgreen@nyu.edu, [1]Chemical and Biomolecular Engineering, New York University Polytechnic School of Engineering, New York, New York, United States*

Organic chemistry has a rich history filled with stories and fascinating characters, which have been used in enhancing the teaching of this subject to sophomore undergraduates studying the subject for the first time at the engineering school of New York University. The students in the class vary from chemical engineering to pre-medical students. The course uses a flip teaching approach in which videos covering the entire year's subject matter are on the web (organicchemistryprinciplesincontext.com) presenting only the scientific principles. Class time is also spent only on the scientific principles. The historical material, context and stories are made available to the students in a text: "Organic Chemistry Principles in Context: A Story Telling Historical Approach," ($25 paper and $9.99 Kindle) The principles are presented in context as for a few examples: carbocations are discovered by the students in the processes by which high octane fuel is produced industrially using the identical principles by which terpenes are made in vivo; organic chemical reactions are discovered in the methods by which

Woodward synthesized cholesterol and Corey synthesized prostaglandin; the nature of carbonyl chemistry is discovered by the study of the catabolism of fats and sugars. The students are held responsible only for the principles in the context presented. We are delighted to find the history, context and storytelling attracting them to the subject in a manner not experienced in long years of teaching by this professor.

HIST 11 - Autograph books of Tetsuo Nozoe: July 19, 1953 to October 16, 1994

Jeffrey Seeman[1]*, jiseeman@yahoo.com,* [1]*University of Richmond, Richmond, Virginia, United States*

For over 40 years and in 1179 pages, hundreds and hundreds of chemists, their families and friends entered their autographs, well wishes, poems, puzzles and chemical pictography into the autograph books of eminent chemist Tetsuo Nozoe (1902 - 1906). These 1179 pages along with specially commissioned essays and perspectives have now been published in 15 consecutive issues of The Chemical Record, a journal of the Chemical Society of Japan, and are free-access for at least three more years. In addion, a specially constructed website, also free-access for three more years, provides the entire project in a very user-friendly fashion which includes two indices (names and places of those signing the books). The editor of the project will discuss the life of Professor Nozoe and present his favorite inscriptions from the Nozoe Autograph Books.

HIST 12 - From the history of stereochemistry: Louis Pasteur's language for molecular chirality

Joseph Gal[1]*, joe.gal@ucdenver.edu,* [1]*UCH Clinical Laboratories, University of Colorado School of Medicine, Aurora, Colorado, United States*

The discovery of molecular chirality via the resolution of (±)-tartaric acid [(±)-TA] by Pasteur (1822-1895) in 1848 is widely known. However, his contributions to the language of stereochemistry are less-well appreciated. He expressed concern about the lack of suitable language for his new science of chiral crystals and molecules and invented terminology and nomenclature for it, in French. He adapted *dissymétrie* (dissymmetry) for what we call 'chirality' today. In 1830 Swedish chemist Jöns Jacob Berzelius (1779-1848) coined *isomers* for different substances with the same elemental composition, and Pasteur applied 'isomers' to his mirror-image chiral molecules and other isomeric forms. In 1856 *enantiomorph* was introduced for chiral crystals by German mineralogist Carl Friedrich Naumann (1797-1873), but Pasteur, who knew Naumann personally, did not adopt 'enantio' terminology. *Acide racémique* (racemic acid) was the French name for (±)-TA coined by Louis Joseph Gay-Lussac (1778-1850), and Pasteur adapted *racémique* as an adjective for the equimolar combination of two enantiomers, thereby launching today's 'racemic' terminology. *Paratartaric acid*, introduced by Berzelius, was another name for (±)-TA, and Pasteur tried *paratartaric* in the connotation of racemic, but (thankfully) 'racemic' prevailed. He used 'right tartaric acid' and *acide tartrique ordinaire* (ordinary tartaric acid) for (+)-TA and 'left tartaric acid' for (-)-TA, but also tried, and eventually abandoned, *acide dextroracémique* (dextroracemic acid) and *acide lévoracémique* (levoracemic acid) for the TA enantiomers. The latter names, while appearing incongruous today, were logical then, and inspired today's dextro/levo nomenclature, e.g., *dextro*-tartaric acid. Pasteur did not, however, include dextro/levo in the names of other chiral substances. He called achiral TA 'inactive tartaric acid', but indicated that French chemist Victor Dessaignes (1800-1885) named it 'mesotartaric acid', which gave rise to today's *meso* prefix in stereochemistry (e.g., *meso*-TA, *meso*-2,3-butanediol). Some of Pasteur's chirality-related vocabulary is essential stereochemical lexis today in English, French, and other languages.

HIST 13 - Legacy of British biochemist Frederick Sanger

Joe Jeffers[1]***,*** *jeffers@obu.edu,*[1]*Ouachita Baptist Univ, Arkadelphia, Arkansas, United States*

Fred Sanger was awarded two Nobel prizes, one for sequencing a protein, the other for nucleic acid sequencing methods. Work for the first established the idea of a genetic code; work for the second established the DNA sequencing method that was used for the human genome project. In between, his RNA sequencing work verified the code and revealed some variations to the code. Three of his former graduate students and one former post-doctoral student won Nobel prizes of their own. This talk will outline these events.

HIST 14 - Karl Karlovich Klaus (1796-1864): Discoverer of ruthenium

David Lewis[1]*, lewisd@uwec.edu,* [1]*Chemistry Department, UW-Eau Claire, Eau Claire, Wisconsin, United States*

The year 2014 was the 150th anniversary of the death of Russian chemist, Karl Karlovich Klaus (Carl Ernst Klaus, Клаус Карл Карлович, 1796-1864), Professor of Chemistry at Kazan University, and discoverer of the element ruthenium. Klaus is an interesting study: from a neglected childhood, he educated himself well enough to qualify as a pharmacist in St. Petersburg and Dorpat. Following his graduation from Dorpat, he became a highly respected pharmacist in Kazan. A gifted artist, he was chosen to accompany scientific expeditions in the Volga-Ural region of Russia; this awoke his interest in chemistry. He sold his pharmacy, and obtained graduate credentials in Dorpat that allowed him to take the Chair of Chemistry at Kazan. Here he first isolated ruthenium as the pure metallic element, but it took several years of correspondence with his former mentor, Osann, for him to be accorded his place as the sole discoverer of the metal. At the pinnacle of his scientific career, family concerns led to him lraving his professorship at Kazan, and returning to Dorpat. Klaus' life and career will be discussed.

HIST 15 - Early history of polyaniline: Discovery and origins

Seth Rasmussen[1], *seth.rasmussen@ndsu.edu, [1]Department of Chemistry and Biochemistry, North Dakota State University, Fargo, North Dakota, United States*

The discovery that the conductivity of conjugated organic polymers can be controlled via redox processes has led to materials that combine the electronic properties of inorganic semiconductors with the weight and density of plastics. The oldest known example of these materials is polyaniline, although its conductive nature was not recognized until the 1960s. The discovery and origin of this polymeric material, however, is a matter of some debate, with little agreement as to when this occurred or who deserves credit for its discovery. Over the years, the discovery of polyaniline has been attributed to Friedlieb F. Runge, Carl Julius Fritzsche, John Lightfoot, and Henry Letheby. In order to bring some clarity to the early history of this material, the reports of aniline and its products by these various researchers during the 1800s will be presented. These results will then be evaluated in light of our current knowledge of polyaniline in order to determine if it is possible to attribute priority for the discovery of polyaniline.

HIST 16 - 100 years of service to chemistry in Virginia

Ann Sullivan[5], *asullivan@reynolds.edu, Kristine Smetana[3], Linette Watkins[2], Janet Asper[4], Joseph Crockett[1]*

[1]Bridgewater College, Bridgewater, Virginia, United States; [2]Dept Chem Biochem, MSC 4501, James Madison University, Harrisonburg, Virginia, United States; [3]Chemistry Dept--ACS Coordinator for CCED, John Tyler Community College, Chester, Virginia, United States; [4]Chemistry, University of Mary Washington, Fredericksburg, Virginia, United States; [5]School math, Science, Engineering, Reynolds Community College, South Prince George, Virginia, United States

The Virginia section was began as a chemistry club in 1907. After determining the desire to have a more comprehensive interaction with fellow chemists in Virginia, the chemistry club began the process of becoming a local section of the American Chemical Society. The Virginia section was formed in 1915. We are celebrating our 100th anniversary this year.

HIST 17 - Aspirin: Incorporating the history of chemistry in the community college classroom

Gita Perkins[1,2], *gitaperkins@gmail.com, [1]Science/Chemical Education, Arizona State University, Tempe, Arizona, United States; [2]Chemistry, Maricopa Community College, Phoenix, Arizona, United States*

Chemistry is a human enterprise (Rasmussen, 2007), and there seems to be only a passing interest in the history of chemistry, although the Center for the History of Chemistry at the University of Pennsylvania predicted that there will be a shift (Kauffman, 1987). According to Rasmussen, 2007, 2008, the last several decades have seen this shift due to the value History of Science adds to a curriculum. Among the reasons documented by Rasmussen, 2007 for the incorporation of the History of Science into graduate and undergraduate courses include a better comprehension of scientific concepts and methods, intrinsic worth, the portrayal of science as a human enterprise, and making the abstract more concrete and engaging for students. In addition, studies have shown that the use of the history of chemistry approach develops positive attitudes toward the study of chemistry (Abell & Lederman, 2008). This submission is an effort to integrate the history of chemistry perspective on Aspirin into the curriculum, prior to teaching theoretical yield and limiting reactant in the formation of aspirin. Chronologically, community college students will be taken back to the times 400 BC when Hippocrates recommended chewing on the bark of a willow tree. 18th century brings in the existence of an astringent substance found by Stone (Hademenos, G., 2005). An attempt will be made to enhance visual learning by the addition of images such as of salicin, the natural substance responsible for the pain relief effects of the willow tree. The year 1860s will reveal Hermann Kolbe achieving a laboratory synthesis of salicylic acid and its sodium salt from phenol, carbon dioxide and sodium. Kolbe's student then establishes the first factory for the large-scale production of synthetic salicylates. The event that follows is Hoffmann's synthesis of a more palatable acetyl derivative. Students finally complete an assessment on the major historical events involved in the discovery of Aspirin.

HIST 18 - Edwin Land and instant photography: An ACS National Historic Chemical Landmark

***Jennifer Maclachlan*[3,1]**, *pidgirl@gmail.com, John Driscoll[2,1], [1]PID Analyzers, LLC, Centerville, Massachusetts, United States; [2]NHCL Committee Chair & NESACS Public Relations, Northeastern Section of the American Chemical Society, Sandwich, Massachusetts, United States; [3]Public Relations, Northeastern Section of the American Chemical Society, Sandwich, Massachusetts, United States*

ACS grants Landmark status to seminal achievements in the history of the chemical sciences and provides a record of their contributions to chemistry and society in the U.S. The Northeastern Section of the American Chemical Society (NESACS) applied for National Historic Chemical Landmark (NHCL) status for Edwin Land's Research Lab at 700 Massachusetts Ave. which is at the corner of MA Ave, and Osborne Street. This is the first NHCL in Massachusetts which is quite surprising with all the technology in this area. The process to designate this National Historic Chemical Landmark will be described including the various commemorations of this important event from the dedication at the site of the plaque on Thursday August 13, 2015 followed by a reception at the MIT Museum for ACS members and Polaroid Retirees to the special symposium on Friday August 14, 2015 by Edwin Land's former employees at the MIT Museum for MIT personnel, Polaroid Retirees and Cambridge residents (the public is also invited).

HIST 19 - Quiet revolution revisited: Theory vs. practice in nineteenth-century German chemistry

***Alan Rocke*[1]**, *ajr@case.edu, [1]History, Case Western Reserve University, Cleveland, Ohio, United States*

The phrase 'quiet revolution' has been applied to a set of roughly simultaneous events in European chemistry, including the decline of electrochemical dualism, the rise of type theories based on substitution, and a reform of atomic weights, culminating in the rise of the theory of chemical structure and the periodic table of the elements. What has been less noticed is a transformation, among members of the chemical community, of the very character of what went by the name 'theory.' The speaker will argue that this transformation was associated with a significant shift in the relevance of basic chemical research to the rising chemical industry, particularly in the German-speaking countries.

HIST 20 - Tale of three generations: Interactions between historical context and disciplinary development among German chemists, 1871-1945

***Jeffrey Johnson*[1]**, *jeffrey.johnson@villanova.edu, [1]History, Villanova University, Villanova, Pennsylvania, United States*

This paper will examine some of the aspects of the social and institutional context of modern Germany (from the 1860s to the 1940s) that particularly favored certain styles and disciplinary directions in chemistry, especially synthetic organic chemistry during the late nineteenth century, which in turn had a reciprocal impact on German industry, and through it on politics and war in the twentieth century. The paper will approach this broad problem by focusing on three generations of German chemists: the "founders," who were positioned to lead the discipline as the process of German national unification reached its culmination in 1871; the "reformers," who entered the discipline between the 1870s and the First World War and became the successors of the founding generation; and the "crisis generation," whose careers began in the troubled years after 1914 and who had to work in contexts marked by extremes of war and politics far different from the experiences of their predecessors. By comparing and contrasting the generations, their disciplinary directions, and the broader implications thereof in changing

historical contexts, the paper will bring out some of the most significant ways in which the discipline of chemistry has shaped and been shaped by modern history.

HIST 21 - Mixed messages: Divergent motives and frontier science at the Hickrill Chemical Research Laboratory

***Stephen Weininger[1]**, stevejw@wpi.edu, [1]Chemistry, Worcester Polytechnic Institute, Worcester, Massachusetts, United States*

A short article in the 5 December 1948 New York Times announced the opening of the Hickrill Chemical Research Laboratory on the estate of its sponsors, Sylvan and Ruth Alice Weil, 45 miles north of New York City. Hickrill's Director of Research, William von Eggers Doering, was an assistant professor of organic chemistry at Columbia University, and Mrs. Weil, an undergraduate theater and poetry major, had enrolled in Columbia as an adult and earned a PhD under Doering's supervision in 1946. The Laboratory's stated mission was to "concentrate[…] on the synthesizing of new substances for medical advancement." In fact, the research papers that emerged from Hickrill made no mention of medical testing or applications. They did, however, make important contributions to theoretical organic chemistry. Based on published material and interviews with Hickrill personnel, this talk documents a frequent historical problem: decoding the major figures' statements and motives in the launching of new scientific endeavors. It will also offer some reflections on the promises and perils of private research funding.

HIST 22 - John Tyndall and chemical physics

***William Brock[1]**, william.brock@btinternet.com, [1]Chemistry, University of Leicester, Eastbourne, United Kingdom*

The Irish scientist John Tyndall (1820-93) is usually identified as a physicist and Faraday's successor at the Royal Institution in London. However, active at a time when the disciplinary boundaries of inorganic, organic and physical chemistry were being consolidated, Tyndall (who learned chemistry from Frankland and Bunsen: PhD at Marburg 1850) dissolved such boundaries in his experimental work on diamagnetism, heat, light, sound and electricity. These experimental fields came to define 19th- and early-20th century British experimental physics, and its teaching in British schools and universities until the 1950s. Tyndall's commitment to particulate, molecular explanations of physical phenomena owed much to his chemical training. In the 20th century his experimental work transferred back into chemistry as chemists developed physical methods for determining composition and mechanisms. The international project to edit Tyndall's journals and correspondence helps shed light on his role as a chemical physicist.

HIST 23 - History and philosophy as an emergency exit? The case of Maurice Delacre (1862-1938)

***Brigitte van Tiggelen[1]**, vantiggelen@memosciences.be, [1]Memosciences, Leuven, Belgium*

Educated as an organic chemist in what he calls the theories of Wurtz, the Ghent professor Maurice Delacre leaves the field in total disbelief fifty years later. Indeed, he comes to the conclusion that not only atomism, valence, and the periodic table are mere hypotheses, but also rejects structural and even linear formulae. These convictions grew out of his laboratory bench work, focusing on the gradual synthesis of the benzene chain, along which he stumbles on compounds like pinacols, whose chemical behavior escape the frame of the organic chemical concepts of his time. Facing the fact, and letting go of the theory, Maurice Delacre turns to history and philosophy to make sense of what he perceived as an impasse in his field. He published his *Histoire de la chimie*[1] in 1920, later quoted by Helene Metzger as the perfect counter-example to her own approach to the history of chemistry. And three years later, his *Essai de philosophie chimique*[2] formalizes the teachings of his experimental work and criticizes the way theories of chemistry are introduced as the foundation of chemical education.

[1] M. Delacre, Histoire de la chimie, (Paris :Gauthier-Villars, 1920).
[2] M. Delacre, Essai de philosophie chimique, (Paris : Payot, 1923).

HIST 24 - History of recent chemistry: New wine in old flasks?

***Carsten Reinhardt[1]**, creinhardt@chemheritage.org, [1]Office of the President, Chemical Heritage Foundation, Philadelphia, Pennsylvania, United States*

Arguably, history of chemistry, as its ‘siblings’ history of physics and history of biology, covers the history of a discipline and of a profession. The history of the history of chemistry is even wedded to the emergence of chemistry as a discipline, as Christoph Meinel argues in his talk. However, in the last 30 to 40 years, a secular transformation occurred that potentially affects the meaning of chemistry at various levels. The power of the concept of discipline has weakened considerably, in both the analytical and practical domains. Sociologists and historians of science alike point to new modes of the production of knowledge. Practitioners of chemistry increasingly use labels such as life or nano to fit in, and they do so very successfully. The chemical industry has given up most of its basic research endeavors, still going strong in the 1970s, and perhaps as a consequence has lost much of its former hi-tech appeal. Increasingly, though chemical companies of course still do exist, the industry moves into the areas of materials and biotech, using them to define their brand. In so doing, so the argument, they follow science. The concept of a knowledge society, now again at the analytical level, even proclaims the permeation of society by scientific knowledge. In my talk I will ask what we, as historians of chemistry, can do to tackle some of these challenges, which in my view present more opportunities than threats.

HIST 25 - How science historians helped create chemistry as a discipline

***Christoph Meinel**[1], christoph.meinel@uni-regensburg.de, [1]History of Science, University of Regensburg, Regensburg, Germany*

The paper will argue that in the past, historical narratives played a crucial, yet often overlooked, part in creating the chemical community and in defining the territory of the discipline. Towards the end of the eighteenth century, the evolution of the modern system of scientific disciplines gave birth to a new kind of disciplinary historiography. The newly emerging sciences often relied upon historical arguments in order to demonstrate their legitimacy, utility and dignity. Addressing the learned community and influential elites alike, this kind of literature, including the new genre of scientific biography, became increasingly popular – and in chemistry even more so than in most other natural sciences. As a regular element in academic curricula, courses in the history of chemistry provided the pedagogical tools to socialize young students into the chemical community. In doing so, the nineeenth century favoured national and theory-oriented approaches. The great popularity of this sort of historiography, written by chemists for fellow chemists, sharply declined after the turn of the century. By then, the scientific disciplines were so well established and so firmly institutionalized that they were no longer needed to acquire legitimacy or status from history. Furthermore, a growing alienation between the ‘two cultures’ weakened this kind of argument. It was therefore not until the 1990s that a new historiography of chemistry began to emerge. The paper will close by asking whether this recent upsurge was triggered by the circumstance that the classical disciplines are beginning to disintegrate or to merge into new hybrid fields, and what these trends could mean for an adequate historical treatment of chemistry.