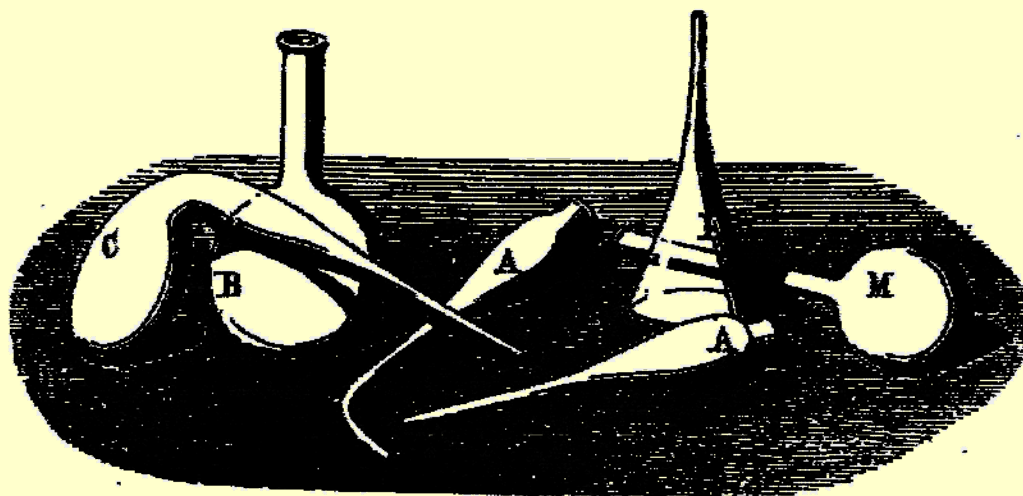




American Chemical Society  
**DIVISION OF THE  
HISTORY OF CHEMISTRY**



**PROGRAM & ABSTRACTS**

244<sup>th</sup> ACS National Meeting  
Philadelphia, PA  
August 19-23, 2012

*S. C. Rasmussen, Program Chair*

## DIVISION OF THE HISTORY OF CHEMISTRY

**Chair:** 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](mailto:tomstrom@juno.com)

**Chair-Elect:** Ned D. Heindel  
Lehigh University  
Department of Chemistry  
Seeley G. Mudd Lab  
Bethlehem, PA. 18015  
Phone: (610) 758-3464  
Fax: (610) 758-3461  
Email: [ndh0@lehigh.edu](mailto:ndh0@lehigh.edu)

**Past Chair:** Janan M. Hayes  
Merced College (retired)  
6829 Barbara Lee Circle  
Sacramento, CA 95842  
Phone: (916) 331-6886  
Email: [janan.hayes@yahoo.com](mailto:janan.hayes@yahoo.com)

**Secretary-Treasurer:** Vera V. Mainz  
2709 Holcomb Drive  
Urbana, IL 61802  
Phone: (217) 328-6158  
Email: [mainz@illinois.edu](mailto:mainz@illinois.edu)

**Program Chair:** Seth C. Rasmussen  
Department of Chemistry and Biochemistry  
North Dakota State University  
NDSU Dept. 2735, P.O. Box 6050  
Fargo, ND 58108-6050  
Phone: (701) 231-8747  
Fax: (701) 231-8831  
Email: [seth.rasmussen@ndsu.edu](mailto:seth.rasmussen@ndsu.edu)

**Bulletin Editor:** Carmen J. Giunta  
Le Moyne College  
1419 Salt Springs Rd.  
Syracuse, NY 13214-1399  
Phone: (315) 445-4128  
Fax: (315) 445-4540  
Email: [giunta@lemoyne.edu](mailto:giunta@lemoyne.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: [mvorna@cnr.edu](mailto:mvorna@cnr.edu)

**Councilor:** 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](mailto:rae4@psu.edu)

**Alternate Councilor:** Joe Jeffers  
Ouachita Baptist University  
410 Ouachita Street, Box 3786  
Arkadelphia, AR 71998-0001  
Phone: (870) 245-5216  
Fax: (870) 245-5241  
Email: [jeffers@obu.edu](mailto:jeffers@obu.edu)

**Alternate Councilor:** Arthur Greenberg  
Department of Chemistry  
University of New Hampshire  
Parsons Hall  
Durham, New Hampshire 03824  
Phone: 603 862-1180  
Fax: 603 862-4278  
Email: [art.greenberg@unh.edu](mailto:art.greenberg@unh.edu)

**Historian:** Gary Patterson  
Department of Chemistry  
Carnegie Mellon University  
Pittsburgh, PA 15213  
Phone: (412) 268-3324  
Fax: (412) 268-1061  
Email: [gp9a@andrew.cmu.edu](mailto:gp9a@andrew.cmu.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](mailto:jsharkey@pace.edu)

# Final Program

## HIST

### DIVISION OF THE HISTORY OF CHEMISTRY

S. C. Rasmussen, *Program Chair*

#### SUNDAY MORNING

Section A

Sheraton Philadelphia City Center - Salons 5/6

#### General Papers

S. C. Rasmussen, *Organizer*

J. Jeffers, *Presiding*

- 9:30 1.** The cyclohexadienyl radical problem and the Whiffen effect: A foreshadowing of the Woodward-Hoffmann Rules? **E. T. Strom**
- 10:00 2.** Wilhelm Heintz (1817-1880) and the chemistry of the fatty acids. **P. J. Ramberg**
- 10:30 3.** Kamlet Laboratories and Miles Laboratories Correspondence, 1941-1945 -A search for Credit. **D. F. Martin**, B. A. Reiger
- 11:00 4.** A philatelic tribute to Marie Curie. **D. Rabinovich**

#### SUNDAY AFTERNOON

Section A

Sheraton Philadelphia City Center - Salons 5/6

#### Chemistry Books Edited by E. F. Smith

Cosponsored by Bolton Soc

N. Heindel, *Organizer, Presiding*

- 1:00** Introductory Remarks.
- 1:05 5.** Jim Bohning: A life in chemistry and history. **M. Bowden**
- 1:35 6.** Smith: An overview of his life. **V. V. Mainz**
- 2:05 7.** Edgar Fahs Smith as a book collector. **J. L. Sturchio**
- 2:35** Intermission.
- 2:50 8.** Edgar Fahs Smith: Electrochemist. **G. D. Patterson**
- 3:20 9.** "Beware! A Priestley has entered the land". **R. Blatchley**
- 3:50 10.** Father of two divisions: Edgar Fahs Smith and the birth of CHED and HIST. **R. A. Egolf**
- 4:20 11.** Edgar Fahs Smith as biographer and historian. **A. Greenberg**

#### SUNDAY EVENING

Sheraton Philadelphia City Center - Salon 9

**5:00 - 8:00** HIST Executive Committee Meeting

## MONDAY MORNING

Section A

Sheraton Philadelphia City Center - Logans 2

### Celebrating the Sesquicentennial of the Land Grant College Act

Cosponsored by PRES

R. Egolf, *Organizer, Presiding*

**9:00** Introductory Remarks.

**9:05 19.** Thomas Green Clemson, early advocate for applying science to agriculture. **D. Eubanks**

**9:35 13.** "No one was killed or seriously hurt in the process," chemistry during the early days of Michigan State University, the pioneer land-grant university. **R. E. Maleczka**

**10:05 14.** Evan Pugh, chemical education, and the fight for Pennsylvania's land grant designation. **K. A. Yarmey**

**10:35** Intermission.

**10:50 15.** Delaware State University and the second Morrill Act of 1890. **A. Goudy**

**11:20 16.** Second Woman ACS Member, Dr. Rachel Lloyd, Met First Woman ACS Member, Rachel Bodley, Before Either Was A Member. **M. A. Griep**

### Future of the History of Chemical Information

Sponsored by CINF, Cosponsored by HIST

## MONDAY AFTERNOON

Section A

Sheraton Philadelphia City Center - Logans 2

### Celebrating the Sesquicentennial of the Land Grant College Act

Cosponsored by PRES

R. Egolf, *Organizer, Presiding*

**1:45** Introductory Remarks.

**1:50 17.** Implementation of the Morrill Act in New Hampshire. **P. R. Jones**

**2:20 18.** Education on the prairie: Early history of North Dakota State University. **S. C. Rasmussen**

**2:50 12.** Justin Smith Morrill and the Land-Grant College Act of 1862. **R. A. Egolf**

**3:20 Intermission.**

**3:35 20.** University of Illinois and the Morrill act. **V. V. Mainz**

**4:15 21.** Relevance of the Morrill Act in current challenges to undergraduate and graduate chemistry programs. **J. S. Francisco**

## MONDAY EVENING

Section A

Pennsylvania Convention Center - Hall D

### Sci-Mix

S. C. Rasmussen, *Organizer*

**8:00 - 10:00**

**4, 6.** See previous listings.

**30.** See subsequent listings.

## TUESDAY MORNING

Section A

Sheraton Philadelphia City Center - Logans 2

### Characters in Chemistry

G. Patterson, *Organizer, Presiding*

**8:00** Introductory Remarks.

**8:05 22.** Robert Bunsen's sweet tooth: Bunseniana in the Oesper Collections. **W. B. Jensen**

**8:50 23.** Who was the real Joseph Black? **R. G. Anderson**

**9:30 24.** The Quaker rustic as natural philosopher: John Dalton and his social context. **A. J. Rocke**

**10:10** Intermission.

**10:30 25.** The chemistry of Lucrezia Borgia, et al. **C. L. Cobb**

**11:00 26.** Sir William Crookes (1832-1919). **W. H. Brock**

**11:30 27.** It's a gas! Sir Humphrey Davy and his pneumatic investigations. **S. C. Rasmussen**

## TUESDAY AFTERNOON

Section A

Sheraton Philadelphia City Center - Logans 2

### Characters in Chemistry

G. Patterson, *Organizer, Presiding*

**1:30 28.** Robert Burns Woodward. Enough said. **J. I. Seeman**

**2:00 29.** Fictional characters in chemistry. **C. J. Giunta**

**2:30 30.** Egor Egorovich Vagner (1849-1903): A "wondrously shartwitted" chemist. **D. E. Lewis**

**3:00** Intermission.

**3:15 31.** Martians as chemists and characters. **B. Hargittai, I. Hargittai**

**3:45 32.** George Rosenkranz: A full-range "chemical character". **J. G. Traynham**

**4:15 33.** Paul John Flory: Physical chemist and humanitarian. **G. D. Patterson**

## WEDNESDAY AFTERNOON

Section A

Sheraton Philadelphia City Center - Logans 2

### Dr. Marie Maynard Daly, Her Life and Legacy

Cosponsored by CHF, CMA, and WCC

F. Califano, J. Bryant, Organizers

J. Brown, Organizer, Presiding

**1:30** Introductory Remarks.

**1:35 34.** Mary Letitia Caldwell: educator, researcher, model and mentor. **J. M. Hayes, P. L. Perez**

**2:05 36.** Dr. Marie Maynard Daly. **J. E. Brown**

**2:35 35.** The Scientific Life and Contributions of Marie M. Daly. **L. M. Tollin**

**3:05 37.** The Legacy of Dr. Marie Daly. **J. E. Brown**

## HIST 1 - The cyclohexadienyl radical problem and the Whiffen effect: A foreshadowing of the Woodward-Hoffmann Rules?

**E Thomas Strom**, [tomstrom@juno.com](mailto:tomstrom@juno.com). Department of Chemistry and Biochemistry, University of Texas at Arlington, Arlington, TX 76019-0065, United States

While cyclohexadienyl radical may have been unaware that it had a problem, EPR spectroscopists trying to interpret its spectrum certainly did. The radical is a divinyl methyl radical with the ends bridged by a methylene group. The methylene hyperfine splitting (hfs) is nearly twice as large as it ought to be, as calculated by the pi electron theories of the day. In 1963 David Whiffen of the UK National Physics Laboratory pointed out the significance of the sign of the coefficients in the calculation of the hfs, with the necessity of algebraically summing the coefficients before squaring them. He also predicted that the methylene hfs in cyclobutenyl radical ought to be anomalously low. When this radical was made, his prediction was found to be correct. The "Whiffen effect" subsequently explained other examples of anomalous methylene hfs. This demonstration of the huge impact of coefficient sign of the end carbons on the behavior of the frontier molecular orbitals might have provided a clue that coefficient sign could also impact cyclization behavior.

## HIST 2 - Wilhelm Heintz (1817-1880) and the chemistry of the fatty acids

**Peter J. Ramberg**, [ramberg@truman.edu](mailto:ramberg@truman.edu). School of Science and Mathematics, Truman State University, Kirksville, MO 63501, United States

The nineteenth century German chemist Wilhelm Heintz (1818-1880) studied with Heinrich Rose and Eilhard Mitscherlich during in Berlin during the 1840s and as a student was one of the founders of the Berlin Physical Society in 1845. Because of his initial position in a medical school, and inspired by Justus von Liebig, Heintz became interested in physiological chemistry, especially the identification and analysis of compounds found in animal and vegetable fluids. Between 1845 and 1850, he published 26 papers that described novel methods for isolating and identifying components of various animal fluids, especially human urine. After his call to the University of Halle in 1851, Heintz began a project on the analysis of various plant and animal fats, or the "fat kingdom" as he affectionately called it, in which he called into question the assumed purity of well known fatty acids derived from plants and animals. This paper will recount Heintz' career in Berlin and Halle, and discuss his painstaking methods for demonstrating that some well-known fatty acids, presumed for decades to be pure, were in fact mixtures of other known fatty acids. It will also argue that Heintz' work provides an excellent example of how chemists define a unique chemical species.

## HIST 3 - Kamlet Laboratories and Miles Laboratories Correspondence, 1941-1945 -A search for Credit

**Dean F. Martin**, [dfmartin@usf.edu](mailto:dfmartin@usf.edu). Brodie A. Reiger. Department of Chemistry, University of South Florida, Tampa, Florida 33620, United States

We used the Kamlet Papers Collections [cf. Martin, D. F. and B. B. Martin, Florida Scient. **2007**, 70 40-44] in the USF Tampa Library Special Collections Department to learn if Dr. Jonas Kamlet received appropriate credit for his idea and his patent for rapid, convenient analysis for glucose in urine and blood involving a pill called "Clinitest". Jonas Kamlet took the idea to Miles' Walter Compton, MD, who didn't know what to do with it (according to Edna Yanveh Kamlet Rogers, wife of Dr. Kamlet). More recent statements by a former employee of Miles Laboratory claim that the test was "developed by Dr. Compton"(C&EN, **2011**, 89(34): 51). It is evident that Dr. Kamlet did not (in our opinion) receive appropriate credit, but available correspondence indicated that it was not an issue with him. The correspondence gives an insight into the role of chemical consultants.

## HIST 4 - A philatelic tribute to Marie Curie

**Daniel Rabinovich**, [drabinov@uncc.edu](mailto:drabinov@uncc.edu). Department of Chemistry, The University of North Carolina at Charlotte, Charlotte, North Carolina 28223, United States

Marie Sklodowska Curie (1867-1934) is undoubtedly one of the most celebrated scientists in history and her contributions to science have been honored in many different ways, from the publication of biographies and production of movies to the names of universities, streets and parks all over the world. Her likeness has appeared on coins, commemorative medals and banknotes and in more than 100 postage stamps from some 60 different countries and territories. This presentation, 145 years after her birth, will feature stamps and other philatelic materials dedicated to highlight various aspects of the life and work of MSC, including the centennial of the Nobel Prize in Chemistry she received in 1911 for the discovery of the elements radium and polonium.



## HIST 5 - Jim Bohning: A life in chemistry and history

**Mary Ellen Bowden**, [mebowden@chemheritage.org](mailto:mebowden@chemheritage.org). Chemical Heritage Foundation, Philadelphia, PA 19106, United States

Jim Bohning earned the respect of a wide range of people in the several social and intellectual circles in which he moved— from chemist-historians like himself to professional historians of chemistry; from Nobel Prize-winners and titans of the chemical industry to high school and college students, from editors wanting engaging stories to those demanding scholarly apparatus. Jim was ever generous in sharing his enthusiasms with others and in encouraging them in theirs. By reviewing some of his projects—the what, the why, and the how, we recall his energetic research practices and his dedication to communicating his findings as a raconteur, speaker, and writer.

## HIST 6 - Smith: An overview of his life

**Vera V Mainz**, [mainz@illinois.edu](mailto:mainz@illinois.edu). Unaffiliated, Urbana, IL 61802, United States

Edgar Fahs Smith was born of German parents in York, Pennsylvania in 1854, and died in 1928. Between those dates he lived an extraordinarily rich life. Smith studied at the University of Göttingen under Wöhler and Hübner, receiving his PhD in chemistry in 1876. His first teaching position was in the Towne Scientific School of the University of Pennsylvania as an assistant in analytical chemistry. Five years later, in 1888, he was appointed to the professorship of analytical chemistry at the University of Pennsylvania. He directed and carried out many scientific investigations upon the methods of electrochemical analysis, on atomic weight determinations, on the rare metals and on the complex salts of inorganic acids. Prof. Smith served as the Provost of the University of Pennsylvania for many years and helped increase both the material and intellectual life of the university. Smith was also a prolific author on many topics. He was involved in many professional activities, including his work with the American Chemical Society. He helped mentor many chemists. All in all, he lived a life to be celebrated.

## HIST 7 - Edgar Fahs Smith as a book collector

**Jeffrey L Sturchio**, [jeffreysturchio@optonline.net](mailto:jeffreysturchio@optonline.net). Global Health Council, United States

One of the world's greatest collection of historical books of chemistry was assembled by Edgar Fahs Smith, chemist and provost of the University of Pennsylvania. How the collection was assembled and its contents will be discussed in this presentation.

## HIST 8 - Edgar Fahs Smith: Electrochemist

**Gary D Patterson**, [gp9a@andrew.cmu.edu](mailto:gp9a@andrew.cmu.edu). Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA 15213, United States

Edgar Fahs Smith was one of the most prolific electrochemists in the period 1879-1918. His monograph on “Electro-chemical Analysis” was first published in 1890 and went through 6 editions until 1918. He was a consummate experimentalist and subjected at least 20 metals to electrochemical analysis. He was a master of

electrochemical separations. His most notable experimental advance was the development of the rotating anode method. And he was a popular thesis advisor and produced more than 30 Ph.Ds in electrochemistry alone, plus at least 30 additional doctorates in inorganic chemistry. Perhaps his most famous student was Joel Hildebrand. He was elected to the National Academy of Sciences in 1898. The present paper will survey Smith's contributions to electrochemistry.

### **HIST 9 - "Beware! A Priestley has entered the land"**

**Ron Blatchley**, [rblatch@dejazzd.com](mailto:rblatch@dejazzd.com). *The Priestley House, Northumberland, PA 17857, United States*

Joseph Priestley reenactor Ronald Blatchley discusses excerpts from Edgar Fahs Smith's "Priestley in America" in a first-person presentation.

### **HIST 10 - Father of two divisions: Edgar Fahs Smith and the birth of CHED and HIST**

**Roger A. Egolf**, [rae4@psu.edu](mailto:rae4@psu.edu). *Lehigh Valley Campus, Pennsylvania State University, Center Valley, PA 18034, United States*

Both the Division of Chemical Education and the Division of the History of Chemistry owe their existence in large part to Edgar Fahs Smith. This paper will present the stories of the founding of both divisions, highlighting Smith's role in guiding them in their early years.

### **HIST 11 - Edgar Fahs Smith as biographer and historian**

**Arthur Greenberg**, [art.greenberg@unh.edu](mailto:art.greenberg@unh.edu). *Department of Chemistry, University of New Hampshire, Durham, New Hampshire 03824, United States*

Professor Edgar Fahs Smith wrote a number of brief but illuminating books focused on the lives of early chemists, more specifically on chemists who performed their research and teaching in America. Delightfully written, books such as *Chemistry in America* and *Old Chemistries* capture many biographies in capsule descriptions yet in broader contexts. Specific brief biographical books (e.g. Joseph Priestley, James Woodhouse, John Griscom) present details, chemical and personal, in a characteristically gentle and humorous style.

### **HIST 12 - Justin Smith Morrill and the Land-Grant College Act of 1862**

**Roger A. Egolf**, [rae4@psu.edu](mailto:rae4@psu.edu). *Lehigh Valley Campus, Pennsylvania State University, Center Valley, PA 18034, United States*

Justin Smith Morrill of Vermont was a son of the working class who could not afford a college education. He was elected to the House of Representatives in 1854 and soon became known as a strong advocate for public funding of higher education, specifically in the fields of agricultural and the mechanical arts. He first sponsored a bill to fund the establishment of state colleges through federal land grants in 1857 and succeeded in getting his bill passed in 1858, but President Buchanan vetoed it. He was finally successful in getting his bill passed again and signed by President Lincoln in 1862. This paper will examine the career of Justin Morrill and the history of the battle to pass this historic act of Congress that we are celebrating in this symposium.

### **HIST 13 - "No one was killed or seriously hurt in the process," chemistry during the early days of Michigan State University, the pioneer land-grant university**

**Robert E Maleczka**, [maleczka@chemistry.msu.edu](mailto:maleczka@chemistry.msu.edu). *Department of Chemistry, Michigan State University, East Lansing, Michigan 48824, United States*

In 1850, Michigan's State Agricultural Society petitioned the State Legislature for an agricultural college. With State finances tight, the Legislature turned to the Congress of the United States and asked for a grant of 350,000 acres to foster agricultural education in Michigan. This unprecedented request helped to establish a model for the national education revolution that would be set in motion by the founding of the Agricultural College of Michigan in 1855 and ultimately the Morrill Land-Grant College Acts. The first class of the Agricultural College of Michigan, which in time would be renamed Michigan State University, were taught



“thorough and practical” chemistry in a chemical laboratory that was “inferior to few in the country.” This early history of MSU chemistry during the time of the Morrill Land-Grant College Acts will be presented.

## **HIST 14 - Evan Pugh, chemical education, and the fight for Pennsylvania's land grant designation**

**Kristen A. Yarmey**, [kristen.yarmey@scranton.edu](mailto:kristen.yarmey@scranton.edu). Weinberg Memorial Library, University of Scranton, Scranton, Pennsylvania 18510, United States

In 1863, Pennsylvania's General Assembly passed legislation naming the Agricultural College of Pennsylvania (later the Pennsylvania State University) as the sole beneficiary of the state's Morrill Land Grant, a designation which was desperately needed to fund the College's growing success and to fulfill the broad visions of its president, agricultural chemist Evan Pugh. However, other institutions in the state quickly contested the designation, seeking their own share of the grant despite their more traditional, classical curricula. Combined with the untimely death of Evan Pugh in 1864, this uncertainty and delay over land grant funding hobbled the College and particularly its scientific course of education for years to come. Framed within the evolving context of 19th century chemical education, this case study of Evan Pugh and the fight for Pennsylvania's land grant designation demonstrates the difficulties chemical educators faced in bringing their science to a broader audience of students.

## **HIST 15 - Delaware State University and the second Morrill Act of 1890**

**Andrew Goudy**, [agoudy@desu.edu](mailto:agoudy@desu.edu). Department of Chemistry, Delaware State University, Dover, Delaware 19901, United States

The State College for Colored Students, now known as Delaware State University, was established May 15, 1891 by the Delaware General Assembly under the provisions of the Morrill Act of 1890. Five (5) courses of study leading to a baccalaureate degree were offered: Agricultural, Chemical, Classical, Engineering, and Scientific. In 1944 the College received provisional accreditation by the Middle States Association of Colleges and Schools and in 1947 the name of the institution was changed to Delaware State College. On July 1, 1993, Delaware State College turned another chapter in its history, when then Governor Thomas Carper signed a name change into law, renaming the College to Delaware State University. Over the years the University has grown in stature as a center for teaching, research, and public service. The University currently offers fifty-six (56) undergraduate degrees, including Chemistry (which is approved by the ACS). It also offers twenty-two (22) master's degrees and five (5) doctoral degrees. The Chemistry department now offers MS and PhD degrees in Applied Chemistry. Dr. Harriet Williams was a symbol of excellence in chemistry and education at DSU. She attended preparatory school at Delaware State and graduated with the first class to receive bachelor's degrees in 1934. She returned to Delaware State in 1946 to teach chemistry and she later served as Chair of the department for 35 years. An overview of the past and present state of the University, the Chemistry department, and Dr. Harriet William's contributions will be presented.

## **HIST 16 - Second Woman ACS Member, Dr. Rachel Lloyd, Met First Woman ACS Member, Rachel Bodley, Before Either Was A Member**

**Mark A. Griep**, [mgriep1@unl.edu](mailto:mgriep1@unl.edu). Department of Chemistry, University of Nebraska-Lincoln, Lincoln, NE 68588-0304, United States

Dr. Rachel Lloyd was the first woman to earn a PhD in chemistry, to become a Professor of Analytic Chemistry, and to be regularly admitted into ACS. Her selection for a faculty position in 1887 at the University of Nebraska was made possible in part because it was a Land Grant institution. She carried out her research in beet sugar agriculture and analysis using some of the earliest funds from the Hatch Act. Prior to all of that, she attended eight years of the Harvard Summer Courses in botany and then chemistry while continually improving her occupations. In about 1875, she met Rachel Bodley, who would become an ACS charter member. Lloyd later became the first regularly admitted female member. At the University of Nebraska, Lloyd inspired both young women and men to become chemists so that the ACS Nebraska local section had more women participants than any other.



## **HIST 17 - Implementation of the Morrill Act in New Hampshire**

**Paul R Jones**, [prjones@umich.edu](mailto:prjones@umich.edu). Department of Chemistry, University of Michigan, Ann Arbor, MI 48109-1055, United States

With the passing of the land-grant bill (The Morrill Act) by the U.S. Congress in 1862, the New Hampshire Legislature responded quickly in 1866 with the approval of an enabling act. By 1868 the New Hampshire College of Agriculture and Mechanic Arts had been organized and was led by a chemist, Ezekiel Dimond. Chemistry instruction, a strong component of the program from the outset, included the requirement of original research. The first bachelor's theses were written in 1893; master's theses appeared by 1906; and the first Ph.D.s in chemistry were granted in 1958. Originally located in Hanover on the Dartmouth College campus, the institution was moved to Durham in 1893 and became the University of New Hampshire in 1923.

## **HIST 18 - Education on the prairie: Early history of North Dakota State University**

**Seth C. Rasmussen**, [seth.rasmussen@ndsu.edu](mailto:seth.rasmussen@ndsu.edu). Department of Chemistry and Biochemistry, North Dakota State University, Fargo, ND 58108, United States

North Dakota became a state in 1889, which then made it eligible under the Morrill Act of 1862 to establish a land-grant educational institution that would provide a "liberal and practical education of the industrial classes...". As a result, the North Dakota Agricultural College (NDAC) was formally founded in Fargo on October 15, 1890. Edwin Fremont Ladd was hired as the second faculty member of NDAC and appointed Professor of Chemistry in 1890. As the founding member of the Chemistry Department, Ladd was its guiding spirit from 1890 until his advancement to University President in 1916. During this time, the Chemistry department was a leading force in the growth and development of NDAC and many of the current academic departments were originally part of Chemistry. An overview of the early history of the University, the Chemistry department, and Ladd's contributions will be presented.

## **HIST 19 - Thomas Green Clemson, early advocate for applying science to agriculture**

**Dwaine Eubanks**, [dwaine\\_eubanks@clemson.edu](mailto:dwaine_eubanks@clemson.edu). Department of Chemistry, Clemson University, Clemson, SC 29534, United States

Thomas Green Clemson was appointed Superintendent of Agriculture in 1860. There he promoted his passion for applying scientific principles in agriculture and for establishing agricultural colleges. Clemson was a highly regarded agricultural chemist. He strongly supported the Morrill Act, which granted Federal land to the states to establish agricultural colleges, *except that those states in rebellion were excluded*. Following the Civil War, southern states were allowed to participate, and Clemson ceded his plantation to the state of South Carolina to establish an agricultural college. Clemson was a strong believer in educating farmers in the application of scientific practice; the college supported a vigorous extension service. South Carolina Congressman Asbury Lever teamed with Senator Hoke Smith of Georgia to pass a 1914 bill establishing agricultural extension at land-grant colleges. The many twists and turns from advocacy to actualization provide insight into the politics of agricultural policy.

## **HIST 20 - University of Illinois and the Morrill act**

**Vera V Mainz**, [mainz@illinois.edu](mailto:mainz@illinois.edu). Unaffiliated, Urbana, IL 61802, United States

The Morrill Land Grant College Act, passed in 1862, enabled the state of Illinois to found the Illinois Industrial University in Urbana in 1867. In addition to the required education in agriculture, engineering and military tactics, the first President of the University, Dr. John Milton Gregory, believed that the function of the University should be much broader and include courses in other branches of learning, specifically those we now associate with the Liberal Arts. Chemistry courses were part of the curriculum from the beginning. In 1868 then President Gregory declared in his first annual report, "It is especially important that an appropriation should be made to fit up, at once, a chemical laboratory." This was at a time when only a handful of American institutions had even rudimentary chemical laboratory space. This talk will discuss how the study of chemistry prospered at the University of Illinois (the name was changed in 1885). Without the Morrill Act, the state of Illinois might have waited many years for the birth of the institution which has since become one of the greatest public universities in the country.

## **HIST 21 - Relevance of the Morrill Act in current challenges to undergraduate and graduate chemistry programs**

**Joseph S. Francisco**, [francisc@purdue.edu](mailto:francisc@purdue.edu). *Purdue University, West Lafayette, IN 47907, United States*

The makeup of the student population has changed. International students over the years have steadily increased in graduate programs, but the numbers are beginning to show an increased presence in undergraduate programs. Most of the growth in enrollment in science graduate programs has resulted from the enrollment of international students. Domestic undergraduate students make up about a quarter of the students enrolled in graduate schools, and the increases are from women and underrepresented minority groups. About half of the students enrolled in doctoral programs in chemistry drop out before graduation. The challenge is in retaining those students. While universities have focused on preparing the next generation of researchers, the harsh reality is that these students are challenged in finding employment. A fundamental question that needs to be addressed is whether current academic preparation in chemistry addresses a national need. Accelerated technological, environmental, societal and financial drivers continue to push the chemical enterprise worldwide, and chemists working in it, to increasingly think and collaborate globally. These drivers are beginning to impact academia. This presentation will examine whether the intent and spirit of the Morrill Act still has relevance in the current climate of current challenges to the chemical enterprise and chemical education.

## **HIST 22 - Robert Bunsen's sweet tooth: Bunseniana in the Oesper Collections**

**William B. Jensen**, [Jensenwb@ucmail.uc.edu](mailto:Jensenwb@ucmail.uc.edu). *Department of Chemistry, University of Cincinnati, Cincinnati, OH 45221-0172, United States*

The 19th-century German chemist, Robert Bunsen, certainly qualifies as a "chemical character" and is the subject of many surviving anecdotes, collectively known as "Bunseniana." The talk will review many of these anecdotes and their historical sources based on the rich resources of the Oesper Collections in the History of Chemistry of the University of Cincinnati, including several unique items inherited from former students of Bunsen.

## **HIST 23 - Who was the real Joseph Black?**

**Robert GW Anderson**, [rgwa2@cam.ac.uk](mailto:rgwa2@cam.ac.uk). *Clare Hall, University of Cambridge, Cambridge, United Kingdom*

Joseph Black (1728-99) was professor of medicine and chemistry at the University of Edinburgh (early in his career he was at Glasgow). He chemically characterised fixed air (carbon dioxide) and developed the concept of latent heat - but up to now he has been known for little else. Now that a complete edition of his correspondence has been produced, gaps in his scientific career and his social life can be filled in. He taught students from throughout Great Britain, the rest of Europe (including Russia) and from North America. Some of these went on to establish medical schools. Acting as a consultant, he was influential in developing the chemical industry. He was one of a remarkable group of intelligentsia in Enlightenment Scotland: his friends included David Hume, Adam Smith, James Watt and James Hutton. He was a clubbable man and entertained generously at home. We even know the sort of gargantuan meals he served his guests (who may have included, on separate occasions, Dr. Johnson and Benjamin Franklin).

## **HIST 24 - The Quaker rustic as natural philosopher: John Dalton and his social context**

**Alan J. Rocke**, [ajr@case.edu](mailto:ajr@case.edu). *Department of History, Case Western Reserve University, Cleveland, OH 44106, United States*

The founder of the atomic theory in chemistry, John Dalton (1766-1844), had a background and life history that was unlike most of his contemporary colleagues in the British scientific community; as an early biographer noted, the young Dalton was by all appearances "born to be a clodhopper." But appearances deceived. The speaker will characterize Dalton's modest Quaker north-country origins, and point to some connections of this background and culture to the nature of his scientific work.

## **HIST 25 - The chemistry of Lucrezia Borgia, et al.**

**Cathy L. Cobb**, [cobbfetterolf@gforcecable.com](mailto:cobbfetterolf@gforcecable.com). Chemistry and Physics, University of South Carolina Aiken, Aiken, South Carolina 29801, United States

The alchemy of the European Middle Ages has always been an intriguing topic, but perhaps more for its folklore than the actual technology. This presentation will explore the possible chemical techniques and materials available to the notorious Borgia family and their ilk, and how this knowledge may have been deployed in their nefarious exploits.

## **HIST 26 - Sir William Crookes (1832-1919)**

**William H Brock**, [william.brock@btinternet.com](mailto:william.brock@btinternet.com). Department of Historical Studies, University of Leicester, Leicester, United Kingdom

The figure of speech, "chemical character", means more than a chemist who played a role in the drama of chemistry; it refers to someone whose unusual personality and career marked them as out of the ordinary. We take the example of the English chemist William Crookes. His flamboyant bearded and mustached appearance was striking; his career from humble beginnings to the presidency of the Royal Society without academic or industrial tenure was unusual; to contemporaries Crookes's ability to investigate "anomalies" that led to fascinating revelations concerning cathode rays, the radiometer and ideas about the evolution of the matter and chemical elements made him seem a sage. A great science journalist and elder statesman of science who was active at the bench up until the day of his death, we shall find justification for calling him one of chemistry's most extraordinary characters.

## **HIST 27 - It's a gas! Sir Humphrey Davy and his pneumatic investigations**

**Seth C. Rasmussen**, [seth.rasmussen@ndsu.edu](mailto:seth.rasmussen@ndsu.edu). Department of Chemistry and Biochemistry, North Dakota State University, Fargo, ND 58108, United States

Always a popular figure in the history of chemistry, the life and accomplishments of Sir Humphrey Davy are hard to ignore. Often styled a self-made chemist, he went on to achieve far more than most of the conventionally trained scientists of his time, including the isolation and identification of seven new chemical elements. However, what has always made him a true "Character in Chemistry" in my view was his early work with nitrous oxide and an unflinching willingness to make his own body a central aspect of experiments. In hindsight, it seems that his ability to survive his early pneumatic studies was more luck than insight, but early successes from these risky studies provided him the fame and recognition to build a career that would follow with even greater discoveries. The life and work of Davy will be presented, focusing on his early work with gases at Beddoes' Pneumatic Institution.

## **HIST 28 - Robert Burns Woodward. Enough said.**

**Jeffrey I. Seeman**, [jseeman@richmond.edu](mailto:jseeman@richmond.edu). Department of Chemistry, University of Richmond, Richmond, Virginia 23173, United States

Blue.

## **HIST 29 - Fictional characters in chemistry**

**Carmen J Giunta**, [giunta@lemoyne.edu](mailto:giunta@lemoyne.edu). Department of Chemistry and Physics, Le Moyne College, Syracuse, NY 13214, United States

Chemists are rarely the protagonists in works of popular fiction. Exceptions to the previous statement will be the subject of this presentation. Among the best known of these characters are three from the late 19th century: the world's first consulting detective (who developed a chemical test for blood) and experimenters whose concoctions caused dramatic changes in character and appearance. Earlier and later examples will also be presented. Some consideration will be given to genres in which science and scientists play important roles including science fiction, science-in-fiction (coined by Carl Djerassi), and lab lit (Jennifer Rohn).

## HIST 30 - Egor Egorovich Vagner (1849-1903): A "wondrously sharpwitted" chemist

**David E. Lewis**, [lewisd@uwec.edu](mailto:lewisd@uwec.edu). Chemistry, University of Wisconsin-Eau Claire, Eau Claire, WI 54702-4004, United States

Vagner (or Wagner in the German literature) was a true genius, and a true character. As a youngster, he was sent to school in western Russia, only to run away and return to his home at age 16. After qualifying to enter the university, he began studying law, only to start over again when he discovered chemistry. As a student, he was an active participant in the local amateur theater, a love that continued into his adult years. As a chemist, he developed a useful synthesis of alkylzinc reagents, turned potassium permanganate into a useful reagent for the site-specific oxidation of alkenes, first proposed the idea that rearrangements occurred during certain reactions of bicyclic monoterpenes, and proposed the first correct structures of many of the monocyclic and bicyclic monoterpenes. His designation in the title is due to Meerwein.

## HIST 31 - Martians as chemists and characters

**Balazs Hargittai**<sup>1</sup>, [BHargittai@francis.edu](mailto:BHargittai@francis.edu), **Istvan Hargittai**<sup>2</sup>. (1) Department of Chemistry, Saint Francis University, Loretto, PA 15940, United States (2) Hungarian Academy of Sciences, Budapest, Hungary

The "Martians" label originated from the time of the Manhattan Project and was used for the principal Hungarian participants in the defense of the United States in World War II and the Cold War. They included the aerodynamicist Theodore von Karman, the mathematician John von Neumann, and the physicists Eugene P. Wigner, Leo Szilard, and Edward Teller. Wigner, von Neumann, and Teller had their initial training in chemistry and chemical engineering. They made important contributions to chemistry, including the theory of specific heats of and atomic vibrations in crystals by von Karman (with Max Born), a method for isotope separation by Szilard (with Thomas Chalmers), the theoretical description of chemical reactions by Wigner (with E. Witmer), and Teller's Jahn-Teller effect and BET equation. The Martians made a unique group, and all five of them were the most original "characters."

[i] I. Hargittai, *The Martians of Science: Five Physicists Who Changed the Twentieth Century*. Oxford University Press, 2006; 2008.

## HIST 32 - George Rosenkranz: A full-range "chemical character"

**James G. Traynham**, [jimtraynham@msn.com](mailto:jimtraynham@msn.com). Department of Chemistry, Louisiana State University, Baton Rouge, Louisiana 70810-5061, United States

A dictionary definition of "character" usually cites quite a range of traits. George Rosenkranz, associated with the production of The Pill from Mexican yams, is, indeed, a full-range character: An excellent, enterprising high-school student who fretted that he *would* be accepted into the leading university in Hungary or Germany; a university student who supported his studies with unusual, non-chemistry employment and moved rewardingly among the international diplomatic set; a gifted organic chemist and an unorthodox research administrator; an impulsive romancer; a world-class bridge champion. This paper is based on an oral history interview of Rosenkranz conducted by the author in 1997 for the Chemical Heritage Foundation.

## HIST 33 - Paul John Flory: Physical chemist and humanitarian

**Gary D Patterson**, [gp9a@andrew.cmu.edu](mailto:gp9a@andrew.cmu.edu). Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA 15213, United States

Paul John Flory received the Nobel Prize in Chemistry in 1974 for his pioneering work in organizing and completing the field of the physical chemistry of macromolecules. He came from solid Midwestern roots to DuPont during the days of Wallace Carothers. He learned the importance of polymers there and applied his keen mind to the problem of polymer reaction kinetics and molecular weight distributions. He went on to solidify the theory of rubber elasticity during World War II. He established a workable theory of polymer solutions that is still used in industry today. After the War he actively pursued polymer science at Cornell and published his classic *Principles of Polymer Chemistry*. This book is still a valuable contribution to the state of the art in polymer science. Economic and professional uncertainty in the mid-50s led to the Directorship of the Mellon Institute in Pittsburgh. A quick return to academia at Stanford University produced another rich harvest of

polymer science and the long awaited Prize. Not content with merely scientific pursuits, he leveraged his notoriety to assist many scientists behind the iron curtain. He believed in freedom for chain molecules and for humans.

### **HIST 34 - Mary Letitia Caldwell: educator, researcher, model and mentor**

**Janan M. Hayes**, [janan.hayes@yahoo.com](mailto:janan.hayes@yahoo.com). Patricia L. Perez. Project Inclusion, Sacramento, CA 95842, United States

Mary Letitia Caldwell (1890-1972), American biochemist, was the first female assistant professor, the only female member of the senior faculty, and full professor in 1948 at Columbia. Caldwell carried a heavy teaching load and ran an intense research program in nutrition and biochemistry. Her major research topic was amylase, an enzyme that decomposes starches. She determined methods for the purification of amylase and studied crystalline porcine pancreatic amylase. Caldwell suffered from a muscular disorder, with her office on the 9<sup>th</sup> floor of a building with no elevators, thus contributing to her leaving academe in 1959. Caldwell was Marie Daly's thesis advisor. Daly said that Caldwell inspired her students with her respect, technical excellence, research expertise and exhibited a sense of concern for each student's welfare. Caldwell retired from Columbia in 1959 and was awarded the Garvan Medal in 1960.

### **HIST 35 - Dr. Marie Maynard Daly**

**Jeannette E. Brown**, [jebrown5134@comcast.net](mailto:jebrown5134@comcast.net). Independent Scholar, Hillsborough, NJ 08844-4816, United States

This talk will take an in depth look at the life and work of Dr. Marie Daly. Dr Daly was the first African American woman to receive a PhD in chemistry. She was a shy and modest woman who made an impact on the work she did. She also left a legacy for future students. Some of this talk will feature video clips of her and be in her own words. The talk will feature her life from birth to death.

### **HIST 36 - The Scientific Life and Contributions of Marie M. Daly**

**Linda Meade Tollin**, [lmt2050@gmail.com](mailto:lmt2050@gmail.com). Independent Scholar, Retired chemist, Tucson, AZ 85704, United States

Marie Daley was a pioneer who was the first female African American to receive a Ph.D. in Chemistry. This presentation will provide an overview and discussion of her research and academic contributions during a highly respected career that spanned the years between 1949 and 1985.

### **HIST 37 - The Legacy of Dr. Marie Daly**

**Jeannette E. Brown**, [jebrown5134@comcast.net](mailto:jebrown5134@comcast.net). Independent Scholar, Hillsborough, NJ 08844-4816, United States

This talk will feature information learned by conversations with people who knew Dr. Marie Daly. Einstein College of Medicine where Dr. Daly worked, started the King Kennedy Program to increase the number of minority students able to become students. I will presents some of the audio from conversations with Dr. Valiere Alcena who was the first recipient of the King-Kennedy Award and Dr. Stephen Lazar who was on the faculty at the time and a friend of Dr.Daly. I will also discuss information about the students who were recipients of the Queens College Daly scholarship fund for minority chemistry students.