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February 2005

PERIODICAL

FIFTY YEARS AGO IN *THE SOUTHWEST RETORT*

As of Jan. 1, ACS has become the owner and publisher of *The Journal of Organic Chemistry*. Previously this monthly journal had been owned by the University of Chicago and published by the Williams & Wilkins Co. of Baltimore. **Dr. George H. Coleman** of Wayne State University will continue as Editor-in-Chief.

Originally a bi-monthly, the journal was started in March, 1936 by a group of organic chemists under the leadership of **Professor Morris S. Kharasch** of the University of Chicago. From the start, the ACS Division of Organic Chemistry has had an important part in the management of the journal. The secretary of the division has served on the executive committee of the board of editors.

Acquisition of this journal brings to eight the number of periodicals owned and published by ACS. The others are: *Journal of the American Chemical Society, Analytical Chemistry, Industrial and Engineering Chemistry, Chemical & Engineering News, Chemical Abstracts, The Journal of Agricultural and Food Chemistry,* and *The Journal of Physical Chemistry*.

Grants totaling $852,422 for chemistry research projects at Texas A&M College, the University of Texas, and Rice Institute were recently announced by the Robert A. Welch Foundation. The totals going to A&M are $257,000, the University, $382, 000, and Rice, $295,422. Grantees at College Station are **Fred W. Jensen**, **A. F. Isbell**, **Carl M. Lyman**, and **J. R. Couch**. Grantees at UT are **Roger Williams**, **F. A. Matsen**, and **D. H.Simonsen**. Grantees at Rice are **Charles F. Squire**, **Richard F. Tur-ner**, **Henry O. Nicholas** and **Homer F. Leifeste**, **Edward S. Lewis**, **John A. S. Adams** and **John J. W. Rog-ers**, **Martin G. Ettinger**, **Jurg Was-ser**, **W. W. Akers** and **G. T. McBride**, and **George W. Bird**.

The Foundation was created under the terms of the will of **Robert A. Welch**, Houston oil and sulphur operator, who died on Dec. 27, 1952. Mr. Welch directed that 85% of his estate should be used to encourage research in chemistry. Assets of the Foundation have been estimated at approximately $21,000,000, and additional grants probably will be announced next May, according to the trustees. **Daniel R. Bullard** is senior trustee. Other trustees are **Jesse Andrews**, **Wilfred T. Doherty**, and **Clarence M. Malone**.

The Dallas-Fort Worth January meeting was held at SMU, with the meal being prepared by four SMU faculty, **Ogden Baine, Tom Kenner, Price Truitt,** and **Harold Jeskey**.

The speaker was **Warren L. Jensen** of Continental Oil Co. speak-ing on "Additives for Petroleum Pro-ducts."

The University of Arkansas section's January meeting featured **W. Conard Fernelius** of Penn State speaking on "General Trends in the Stability of Chelate Compounds." At U of A, graduate students **Mary Lowe Good** and **James Pauley** will receive their Ph.D. degrees at midterm. **Dr. Marvin T. Edmison** attended the recent National Resources Conference at Little Rock.

Southwest Retort

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Southwest Retort

FIFTY-SEVENTH YEAR February 2005

WHO DISCOVERED PLATINUM?

By Lyman R. Caswell
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We are accustomed to the idea that the seven classical metals—gold, silver, copper, tin, iron, lead, and mercury—were all ancient discoveries by pre-literate artisans; and their sources, physical properties, and metallurgy were already well-known by the time the societies that used them became literate. Platinum, like most of these metals, is also found in the free state in nature, but it did not become identified as a new metal, distinct from gold and silver, until the second half of the eighteenth century. Who discovered it?

The Conquistadors found metal smiths in the Middle and South American civilizations who were skilled in the creation of artifacts from copper, silver, and, especially, gold. The conquerors were more concerned with bullion than with objects of art and set the conquered to work extracting silver and gold from the mountains to enrich themselves and the King of Spain. By 1700 –perhaps earlier, but there is no earlier record —the authorities in what is now Colombia noticed that some gold mines also produced little nuggets that looked like silver but were much harder and could not be melted. These nuggets of *platina*, or "little silver," were regarded as a nuisance, for it was difficult to separate the gold from them. They were thrown away. The Indians who picked the nuggets of gold out of the ore-washing sluices, or *lavaderos*, identified the platinum nuggets as "unripened gold," and threw them back into the river to ripen up. This does not constitute discovery.

The name of Antonio de Ulloa is often mentioned in connection with the introduction of platina to Europe. Ulloa and Jorge Juan, two brilliant young officers in the guardias Marinas, an elite Spanish naval unit, were assigned to accompany the Geodesical Expedition sent to Quito by the Académie des Sciences in Paris to

measure an arc of the merdian at the Equator. The leaders of the expedition were Louis Godin, Charles de la Condamine, and Pierre Bouguer, whose name is also familiar in colorimetry. The purpose of the expedition was to determine whether the earth bulges at the Equator, as predicted by Newton, or at the Poles, as predicted by Cassini and Descartes. The expedition arrived in Quito in 1736 and did not complete its work until 1744, owing to the difficulty of the terrain, the shortage of funds to support the work, and the incomprehension of the goals of the expedition by the local people, many of whom suspected that the real purpose of the expedition was to hunt for treasure. The story of this expedition and its aftermath has recently been retold in *The Mapmaker's Wife* by Robert Whitaker.

On his return from South America in 1745, Ulloa's ship was captured by the English. He was taken to England as a prisoner of war. In a surprising act, considering their prisoner was a naval officer of an enemy power, the English released Ulloa, returned all his papers and possessions to him, and even elected him to membership in the Royal Society!

When he returned to Madrid in July, 1746, Ulloa wrote his *Relación histórica del viage a la América Meridional*. Although Jorge Juan contributed, at most, one chapter to the book, he is the senior author in the title page, because he outranked Ulloa, an early example of a continuing custom. Although the book was written as an official report of the expedition to the Spanish Crown, it is written like a travelogue, in an easy, narrative style. It was soon translated into French, English, German, and other languages. The English translation, *A Voyage to South America*, with "George Juan" as the senior author, ran through several editions. On page 452 of Volume I of the English translation, Ulloa writes, "In the district of Chocó are many mines of Lavadero, or wash gold. ---- Several of these mines have been abandoned on account of the platina; a substance of such resistance, that, when struck with an anvil of steel, it is not easy to be separated; nor is it calcinable; so that [the gold], inclosed within this obdurate body, could not be extracted without infinite labor and change." This appears to be the sum total of everything that Ulloa ever said about platina. A published bibliography of the works of Antonio de Ulloa and of Jorge June makes no mention of any book or monograph on platina by either author. There is no evidence that either Ulloa or any other member of the Geodesical Expedition took samples of platina to Europe. Indeed, at the time of their expedition, Spain and Portugal had already passed laws forbidding the importation of this substance out of fear that it might be used to counterfeit silver coins. It was already being used by counterfeiters in Peru, who gilded their products to fake gold coins.

Under Spanish law, mineral products of the colonies could be exported only to the mother country. Of course, a lot of Spanish gold and silver wound up in other parts of Europe as the result of piracy upon

the annual treasure fleet. By the early 1700's, the English had discovered smuggling to be a more dependable, cheaper, and less risky method than piracy to obtain Spanish treasure. With the connivance of corruptible officials, a lot of the raw gold produced in Colombia was siphoned through the Caribbean port of Cartagena to English-held Jamaica. The swag included occasional nuggets of platinum.

Charles Wood, a professional assayer in Kingston, Jamaica, using the assaying procedures that were standard for raw gold and silver at the time, attempted to assay the platinum nuggets and recognized that they contained a new substance, neither gold nor silver. In 1741, during a visit to England, he gave a written report of his results and samples of platinum to William Brownrigg, a physician and amateur chemist. Brownrigg did nothing with these materials until Wood returned to England in 1749 and persuaded him to repeat and extend his experiments. The results were presented to the Royal Society by William Watson on December 13, 1750, and duly published by that society. In January, 1751, Watson wrote of the findings of Wood and Brownrigg to Georg Matthias Bose in Wittenberg, Germany, who published a German translation of Watson's letter. At the point, the cat was out of the bag, so to speak, and every metallurgist and chemist in Europe wanted samples of the new metal.

Spanish attitude toward platina underwent a reversal in 1759, when Charles III became King of Spain. The new king was eager for expanded economic development of his empire, with new products and new markets. The ban on exporting platina was rescinded, and the Viceroy of New Granada was ordered to collect as much of it as could be recovered from the refuse dumps of the mines and to ship it to Spain. The king endowed a laboratory directed by French physicist Pierre Francois Chabaneau, assisted by chemist Fausto Delhuyar, the co-discoverer of tungsten, to investigate the metallurgy of platinum. Generous samples (pound quantities!) of the crude metal were sent to every chemist in Europe who asked for them. Platinum had been discovered.

But not quite yet. Native platinum contains varying amounts of other metals, including gold and iron. One Comte de Milly, analyzing a sample which contained both, concluded that platinum was an alloy of gold and iron. The influential Comte de Buffon in 1773 published this conclusion in his *Histoire Naturelle*. The error was soon laid to rest by Swedish chemist Torbern Bergman, who in 1779 described the preparation of a series of gold-iron alloys, none of which in any way resembled platinum.

It has been claimed that native American metal smiths were unable to work platinum because they had no means of making heat hot enough to melt it. Nevertheless, many delicate little items of platinum jewelry, alloyed with a little gold, have been found at the La Tolita archeological site in the Esmeraldas region of Ecuador. The context in which these were found has been radiocarbon dated to between the first and fourth

centuries AD. Danish metallurgist Paul Bergsøe showed that these

objects could have been made by coating platinum nuggets with gold dust, heating to melt the gold and create a surface gold-platinum alloy, followed by annealing and forging.

So, who discovered platinum? If we are to credit pre-literate artisans with the discovery of the seven metals mentioned in the first paragraph, then the unknown jewelers of La Tolita should be given some credit, since they recognized platinum as a distinct substance and understood something of its metallurgy. But their knowledge was lost instead of being passed on; or in modern terms, they didn't publish. I think that the modern re-discovery of platinum should be credited to Charles Wood and William Brownrigg, since they were the first persons to make a study of the metal and recognize that it was new.

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Chem Gems & Joules

ACS CHEMISTRY OLYMPIAD MAR. 5. The D-FW Section of the ACS invites interested high school students to participate in the ACS Chemistry Olympiad examinations, Saturday, Mar. 5, from 9-11 a.m. in Room B-304, B Building at Brookhaven College, 3939 Valley View Lane, in Farmers Branch. Fax completed registration forms to Nancy Graff at 972-860-4151. To ask questions of Ms. Graff or to obtain registration forms, please call 972-860-4767 or e-mail her at nmg2462 @dcccd.edu. There is no entrance deadline, but Ms. Graff would like to know how many students to expect. Students may bring completed registration forms with them to the Saturday exam. There is no registration fee. The multiple choice exam lasts two hours. Only nonprogrammable calculators are permitted.

The March exams are to select eleven nominees to compete for selection on the U.S. National Chemistry Olympiad team. The eleven students with the highest scores on the local exam will participate in another exam at Brookhaven on Saturday, April 16, for possible selection to the national team. The top twenty performers on the national exam will participate in a study camp at the U.S. Air Force Academy June 5-19 with four of these students to be selected to travel to the 37th International Chemistry Olympiad in Taipei, Taiwan, July 16-25.

The following website has Olympiad information: http://www.chemistry.org/education/olympiad.html. Directions to Brookhaven College and maps may be found at: http://brookhavencollege.edu/pdf/printmap.pdf.

NSTA ANNUAL CONVENTION IN DALLAS THIS SPRING. The 2005 NSTA Annual Convention will be held in Dallas from Thursday, Mar. 31, through Sunday, April 3. The "Morning of Chemistry" program is scheduled for Friday, April 1, from 8-9:45 a.m. **Kathleen Holley** from this area has been invited by Flinn to perform as part of the Flinn "Morning of Chemistry." This year's program is called "Demonstrations with a Woman's Touch." Flinn has selected seven women chemistry teachers from across the country to present demonstrations at this workshop.

ACT2 SILVER ANNIVERSARY BIENNIAL CONFERENCE IN THE METROPLEX. The ACT2 Biennial Conference Silver Edition will be held July 5-9 at the University of North Texas. Plenary session presenters include **John Gelder**, Chief Reader AP Chemistry

from Oklahoma State, **Andy Cherkas** from Stouffville, Ontario, Canada, **Bette Bridges** from Bridgewater, MA, and **Pat Funk** from Pickering, OH. There were be special workshops on Lab Coat Tie Dye by **Pat Funk**, Burning Book by **Dr. Larry Peck**, and Living Periodic Table by **Dr. Jim Marshall**. Early registration will be from Mar. 1-June 5. This conference begins the 25th year of ACT2 activity. Visit www.statweb.org/act2 for more details as they become available.

[Fox Scientific]

In the November *Retort* we published some material from high school chemistry teachers on the proposed four year science requirement. These items had previously been sent to ACT2 Secretary Bob Casao, who gave us permission to reprint them. We now reproduce some more of these comments to refresh the memory of ACT2 Metroplex members and to inform *Retort* readers about these important matters.

From a Regional Science Coordinator: As it is now written, the 4th year of the science requirement has some problems. The language says that "after successful completion of a biology course" two courses from IPC, chem, and physics can be taken. We at ESC's have been assured that was and is not the intention of the law, but I don't know if it has been changed or not. Also, the language as it was first written seemed to say that if a student took bio, IPC, chem AND physics, she/he would still have to take a course from the list of allowed 4th year sciences. So, students would take 5 years of science (which most of my students did anyway) because taking physics on top of the other 3 would not count as the required 4th year of science. I think 4 (or 5) years of science is a great idea, but have problems with the way the law was written as I first saw it. Also, superintendents are a big group fighting passing of this law, as they consider it another unfunded mandate.

I have strong opinions on things, but ESC folks have been told, and had to sign a form, that we can't lobby about things like this. I'm almost afraid to write this letter to you! 1984—Big Brother is watching.

I would like to add my 2 cents worth on the debate on 4 years of required science. I began teaching in 1968, so I've seen a LOT of pro-

grams come and go. If I'm not mistaken, there was a 4 year requirement a few years ago that was dropped to three. Don't remember why. But I can attest to the fact that districts will begin to mandate more classes per teacher. Right now, Dallas requires teachers in schools on a traditional every day schedule to teach 6 out of 7 classes and those still on the A/B block to teach 7 out of 8 classes. Most of the teachers at my school had 2 or more preps. Many of us had totals over 160 students with some teachers having more than 200 total students. Now, if the district would hire us an aid who would grade all our papers, record the grades, and handle all the paperwork, then 6 classes with 3 preps would be doable—maybe.

I agree the TEKS are a joke. I was told to skip the TEKS that were not being tested on the TAKS this year and then go back and pick them up after the test, IF time permitted.

Why hasn't anyone blown the whistle on TEA for inflating test scores? If the expectation is 44% correct answers, then the student, parent, school, and PUBLIC should know that the student "passed" with a 44, NOT a 70. We have perpetuated a huge lie on society in order to keep the folks in power in power. Our students are woefully less prepared than they were 15 years ago. We have fallen victim to the rule of "looking good rather than BEING good." I've been tempted to download all the TAAS/TAKS conversion tables and mail them to "60 Minutes." This lie must be stopped.

From George Carlin: "In a world of universal deceit, telling the truth is a revolutionary act." And: "Silence is the voice of complicity."

Column Editor Robyn Shipley-Gerko of Plano Sr. High School welcomes future material for this column that would be of interest to chemical educators. Send your material by e-mail to Robyn at Rshiple@pisd.edu.

Continued from Page17

first to ascertain its anaesthetic properties, and to use it in surgery. It was the third anaesthetic to be used, after nitrous oxide and ether, and Simpson urged its advantages over the other compounds including a more profound effect with a smaller quantity, the advantage of a liquid rather than a gas, a lower cost, and a more rapid and more persistent action. Chloroform became the preferred anaesthetic particularly in midwifery. Inevitably there was some reaction against the use of anaesthetics in child-birth from those who decided it was against "natural law", but the reformers prevailed against the reactionaries. Chloroform was accorded the cachet of Royal approval; Queen Victoria had a number of her children born while she was mildly sedated by chloroform, a state known at the time as "Twilight Sleep."

AROUND THE AREA

East Texas Section

Ana-Lab. Peery, Oliver Promoted. Dr. Charles Whiteside, Founder and President of Ana-Lab Corp., announced that **Bill Peery, Jr.** has been promoted to Executive Vice President and **Greg Oliver** has been promoted to Laboratory Manager. Peery grew up in Kilgore, graduating from Kilgore High School. He holds a B.A. degree in biology and chemistry from UT-Austin and a B.S. degree in software engineering from Lamar University. He earned an M.S. degree in computer science and chemistry from UT-Tyler. He has worked for the past 20 years at Ana-Lab and has had a supervisory position over the lab for 15 years. He is a past chair of the East Texas ACS Section and an active member of the American Council of Independent Laboratories. Peery and his wife Sheri have one son, Trey.

Oliver is in his 12th year at Ana-Lab and provides leadership for all analytical operations in the laboratory. He graduated from Loraine High School. He earned a B.S. Chem degree at UT-Tyler and a master's degree in analytical chemis-try from Texas A&M University. He is a past chair and past treasurer of the East Texas ACS Section and treasurer of the East Texas Men of Promise. He has two daughters, Emily and Lexi.

Founded in 1965 by Dr. C. H. Whiteside, Ana-Lab provides quality environmental testing for clients throughout the United States and Mexico. Its corporate offices are headquartered in Kilgore with regional offices in Amarillo, Arlington, Austin, Brownsville, and Houston, plus out-of-state offices in Crofton, MD, Norman, OK, Shreveport, LA, and Huntsville, AL.

Heart O′ Texas

Baylor University. Dr. Kevin Pinney appeared as a panelist on a television special titled "Coping with Cancer." During the fall he gave research seminars on the topic " The Discovery and Development of Vascular Targeting Agents (VTAs) for Cancer Chemotherapy and Related Vascular Specific Diseases" at UT-Arlington, Texas State University, and the University of North Carolina School of Pharmacy.

The Colloquium speaker Jan. 28th was **Patty Wisian-Neilson**. **Dr. Charles Garner** gave a seminar Jan. 21st at UT-Arlington on "C_6F_6 as a Good Leaving Group." New graduate students are **Fernando Hung** from Universidad Central de Venezuela and **Nathan Duncan** from Baylor.

South Plains Section

Texas Tech. Dr. Louisa Hope-Weeks has been elected as Membership Secretary of the Colloid and Surface Chemistry Division of ACS. She is also a member of the Division's Executive Committee. Welch Professor **William Hase** visited South Africa recently to

participate in the International Conference WATOC-2005. His invited lecture was titled "Chemical Reaction Mechanisms."

Prentice-Hall has just published *Introductory Chemistry: A Workbook* by **Dr. Robert E. Blake, Jr.** of this department. This 185 page workbook will accompany Prentice-Hall textbooks in introductory chemistry and supports collaborative and active learning strategies. Doctoral student **Ms. P. Kalyani Martinelango** has been selected by the ACS Division of Environmental Chemistry to receive one of the 2005 Graduate Student Awards in Environmental Chemistry.

Last summer, **Sameer Kirtane** was a Welch Summer Scholar, doing research with faculty member **Dr. Guigen Li**. This work resulted in a paper which is presently in press in *Org. Lett.* Because of this work, Mr. Kirtane is a finalist of the Siemens-Westinghouse Competition (2004) with a $1000 scholarship and goodies like shirts, backpacks, radio interviews, and a digital camera. Dr. Li was recognized as a *2004-2005 Siemens-Westinghouse Competition Mentor*. Mr. Kirtane is also a semi-finalist in the Intel Science Talent Search 2004, which came with a $1000 scholar-ship. Mr. Kirtane wrote to Dr. Li, "I owe so much to you and your lab for trusting me to work on your new find.---- Thanks for all your help and for giving me such a great opportunity."

Texas Tech and Slaton Jr. High School in Slaton sponsored a "Meteorologist Challenge" on Feb. 2. Local meteorologists answered general science questions. The questions were written by the 8th grade pre-AP science class, who hosted the event. Bob Blake from this department contributed the hardware and consultation on the questions.

Dallas-Fort Worth Section

Letter from the Section Chair John St. John. The ACS is not a narrow organization.

The sheer number of members, broad spectrum of occupations, differences in philosophy, education, income, race, age, sex and goals forces the organization to cater to the needs of a membership quite unlike that of any other society. Without question, the DFW ACS Local Section (LS) is a complete microcosm of the national organization, and consequently we have that same set of broad needs.

I call attention to the above generality because my assumption of a leadership role within the DFW LS has not yet brought me closer to taking full advantage of my ACS membership. There are so many committees, activities, awards, meetings and opportunities that our LS appears to cater to all and none of us at the same time. When I query associates who are chemists about why they would choose not to participate in LS activities, their responses differ in context but beneath the surface, the reasoning is that the LS in some way is not serving their needs. We have many members who participate but a higher percentage who do not:

The decision to become a chemist and have a career in this discipline for most probably had three components at some point.

1) An intellectual element that provided a sense of accomplishment.

2) A financial element that provided stability and defined some career goals.

3) A superordinate element sating a desire to make a contribution and enrich the lives of others through the application of this basic science

The above set of elements guide most career decisions and can be found in most career counseling books and articles. As a society of professional chemists, lack of participation must mean that one or more of those career goals is not being met for members. As the Chair of the Local Section, my most important goal is to help this local section begin to meet those needs for chemists; however, I and the other members of the LS leadership need feedback about our section. The list of topics below represents some of the areas in which the DFW Local Section can be very dynamic in helping our members realize their full potential. I would ask that everyone please look at these topics and send me a brief e-mail regarding what could be done in these areas to help chemists in their lives through the ACS:

1. The Southwest Retort
2. National Chemistry Week Activities
3. Local Section Meetings
4. Meeting in Miniature
5. Awards and Award Presentations
6. Local Section Chemistry Employment
7. Academic Research
8. Academic Instruction
9. High School Instruction
10. Social Events
11. Charity
12. Scholarship

My e-mail address is JVS@accesspharma.com and my job this year is to help make this Section work for you as a chemist. Please feel free to contact me at any time with suggestions or questions.

I would like to thank our Past Chair Sean O'Brien. I am very glad to be following in Sean's footsteps; he has made great strides in the leadership of this section.

John St. John

Texas Christian University. Onofrio Annunziata gave a talk titled "Phase Transitions of Protein Aqueous Solutions" on Feb. 11 at UT Arlington.

University of North Texas. Dr. Michael Richmond visited the University of Mississippi, Oct. 20-23, where he delivered a seminar on "Ligand Substitution in Mixed Metal Clusters." **Dr. Trent Selby** attended the Exotic Materials Conference in Salt Lake City, Oct. 15-17, and presented the paper "Flat Dendrimers."

UT – Dallas. Professor Ray Baughman and the **UTD NanoTech Institute** were awarded a $750K DARPA grant for research on artificial muscles.

UT - Arlington. Dr. E. Thomas Strom attended the Society of Petroleum Engineers International Oil Field Chemistry Symposium in Houston, Feb. 2-4, where he co-chaired the session on "Chemical Challenges."

MARCH METROPLEX SEMINAR SCHEDULE

Seminars are sometimes postponed or cancelled, so readers are urged to call the departments or check departmental websites before attending.

Texas A&M – Commerce. Mar 3rd, Dr. Jeff Kelber, UNT, "Interactions of Oxide/Metal Interfaces: Interfacial Chemistry." **Mar 10th**, Dr. Richard Taylor, UTHSC, Houston, TBA. **Mar 31**, Fred McDonnell, UTA, TBA. Seminars are normally at 4:00 p.m. in Room 133, Hall of Science.

UT-Arlington. Mar. 4, Miklos Kertesz, Georgetown University, "Structural and Electronic Properties of Carbon Nanotubes and Organic Crystals." **Mar. 11**, Maher Kalaji, University of Wales, Bangor, UK, "To Sniff or not to Sniff: The Detection of Explosives." Seminars are normally at 2:30 p.m. in Room 114, Chemistry Research Building.

UT-Dallas. Mar. 23, Walter Fast, UT-Austin, "The Enzymology of Bacterial Sensorship." **Mar. 30**, Wes Borden, UNT, "Substituent Effects on the Degenerate Cope Rearrangements of 1,5-Hexadienes and Semibullvalenes. Interpretations and Predictions." Seminars are normally at 3:30 p.m. in Room MP2.214.

UT-Southwestern Biochemistry. Mar. 3, Paul Reider, Amgen, TBA. **Mar. 10**, Phil Zamore, UMass Medical School, TBA. **Mar.** 17, Ueli Schibler, University of Geneva, "The Mammalian Circadian Timing System: From Gene Expression to Physiology. **Mar. 24**, Scott Strobel, Yale, "Crystal Structure of an RNA Splicing Intermediate." **Mar. 31**, Craig Garner, Stanford, "Cellular Mechanisms of Nascent Synapse Assembly." Seminars are normally at noon in Biochemistry L4.176.

UT-Southwestern Biological Chemistry. Mar. 8, Dean Toste, UC-Berkeley, TBA. Seminars are normally at 6:30 p.m. in Biochemistry Conference Room L4.162.

University of North Texas. Mar. 4, Phil Coppens, University of Buffalo, "The Marriage of Time-Resolved Diffraction, Spectroscopy and Chemical Theory in the Study of Molecular Excited States in Crystals." **Mar. 11**, George Richter-Addo, University of Oklahoma, "New Insights into the Binding of NO and Organic Nitroso Compounds with Heme." **Mar. 25**, Peter Sherwood, Oklahoma State University, "Phosphate surfaces —Important Surfaces in Corrosion and Biological Systems Studied by Photoelectron Spectroscopy." Seminars are normally at 3:30 p.m. in Room 324, Masters Hall.

Continued from Page 20 example, Moore's Law. New concepts and inventions change that doubling time for improvement from 40 some years to only a few years or, perhaps in some cases, months. He claims the greatest invention was the invention of invention. He attributes this milestone to the great German chemist Justus von Liebeg around the year 1840. Liebeg had studied with Gay-Lussac in Paris and was convinced of the importance of accurate analytical measurements. He came to the University of Giessen in 1824. He convinced the government to support an expansion of laboratory facilities, and around 1840 he had a lecture theatre and two separate, large laboratories for pharmacy and chemistry students. From handling 15 chemistry students in 1830, he had 174 in 1841. Liebeg originated the large research laboratory focused on invention. Other famous examples of this type, Edison's and Carothers', just built on the Liebeg example.

Here is another example of chemistry as the central science. The rapid pace of technology change stems from that first assembly-line research lab. Before that, chemistry and science in general were the province of talented and wealthy amateurs. The democratization and scale-up of chemistry starts with Liebeg. To learn more about Lienhard's ideas, I recommend his website, http://www.uh.edu/engines.

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tion of sulfuric acid. Some of the chambers are of enormous size, upwards of 180 feet long and of a volume of around 35,000 cubic feet, producing over 10 tons of acid per week. "The great saving effected by the modern improvement of substituting vessels of platinum [many fabricated by Wollaston] for those of glass for the final concentration of the acid, notwithstanding the enormous price of the former, is manifested by the fall in the price of sulphuric acid from 4 d. to 1 1/2 d. per pound."

"Dr. Simpson, of Edinburgh, has discovered an Anaesthetic Agent, as a substitute for sulphuric ether in surgery and midwifery, viz. Chloroform, or the Perchloride of Formyle." Chloroform had been prepared at about the same time (1831-32) by both Soubeiran and Liebig, and its composition was established by Dumas in 1835. Simpson was the ***Continued on Page 12***

THIS MONTH IN CHEMICAL HISTORY

by Harold Goldwhite, California State University, Los Angeles
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Prepared for SCALACS, the Journal of the Southern California, Orange County, and San Gorgonio Sections of the American Chemical Society

In the immediately preceding column I touched on "The Year-Book of Facts In Science and Art " for 1848 but then launched into an article primarily about Gay-Lussac. I now return to the Year-Book to bring you up-to-date (!) on the discoveries of 1848. The epigraph to this volume is interesting: "Every Fact, if it be deserving such a description,- that is to say, if it be truly observed, and accurately stated,- is welcome to the man of Science." – Sir R. H. Inglis Proc. Brit. Association, 1847.

The section in the Year-Book on electrical sciences has several descriptions of new and improved voltaic batteries, of particular interest at the time to telegraph companies. As an example I quote from the Rev. N. J. Cullan, Professor of Natural Philosophy in the Royal College, Maynooth. He modified Grove's platina [platinum] battery by substituting platinized lead or cast iron for Grove's pure platinum, and nitrosulfuric acid and potassium nitrate as electrolytes instead of Grove's mixture of nitric and sulfuric acid. "A plate of cast iron or platinized lead may be had for a shilling [0.05 of a pound], whilst a platina plate of the same size will cost nearly three pounds."

An anticipation of the future is seen in an article on the refining of copper by electricity, the very process that is used today. The optimistic tone of the article, that electricity produced by batteries would be cheaper than the fuel used at the time for copper refining, was not borne out in practice, and electric refining had to wait for the invention of the generator. Nevertheless the imagery used is striking: "In a very few years Australia will send to market more copper than is now produced by all the rest of the world. But if our future penny-pieces are to bear any proportion to the reduced cost of the value of the metal, they must be made of the size of dinner plates!"

Dr. Robert Hare of Philadelphia, most recently Professor of Chemistry at the best-known medical school in the United States, that of the University of Pennsylvania, reported in the Philosophical Magazine improvements in his hydrogen-oxygen blowpipe which allowed him to obtain malleable platinum directly from platina ore. This was an improvement over the method of Wollaston, which produced purer platinum but by a much more elaborate procedure.

The relatively newly discovered metal platinum, first prepared in a state of purity by Wollaston, features prominently in this year's articles as indicated above and also in a report delivered by H. M. Noad on aspects of industrial chemistry to the College of Chemistry. The lead chamber process is now standard for the produc-

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March 2004 DFW ACS Meeting

In view of the ACS National Convention in San Diego during March 13th-17th and the variation in dates for Spring Break, we have not scheduled a March meeting.

April Meeting: Saturday, April 30th, Meeting-in-Miniature at the University of Texas at Arlington. Contact Professor Dmitry Rudevich at 817-272-5245 or e-mail rudkevich@uta.edu.

Wanted: Good Program Ideas to Fund!

Have you been itching to start a new program within your sec-tion, but don't know how to get funding? Would you like to expand or enhance a program that your section already sponsors? If the answer is "yes" to either question, contact your Local Section's Chair about submitting a proposal for an Innovative Projects Grant sponsor-ed by the Local Section Activities Committee (LSAC). These grants support local sections undertaking innovative programs or activities, particularly projects that promote local section and division interac-tion or interaction between multi-ple sections or that improve pro-gramming for a local section with special financial needs. Local sec-tions may request funding up to $3,000. The deadline is April 1, 2005. Approved projects will re-ceive funding by July 15. The 2006 grant application deadlines will be announced later this year.

To apply for an Innovative Projects Grant, visit the ACS OLSA website http://www.chemistry.org/portal/a/c/s/1/acsdisplay.html?DOC=localsections\index.html.Complete instructions, a template for the brief proposal, and a link to a list of some previously funded projects, are available.

The project should be com-pleted within 12 months of the award. Winning local sections are required to submit a report to LSAC within 3 months of comple-tion of the project detailing how the funds were used and the impact which the program had.

LIEBEG AND THE INVENTION OF INVENTION

By E. Thomas Strom

For well over ten years I have been a member of the Program Committee for the Society of Petroleum Engineers International Oil Field Chemistry Symposium. This biennial symposium demonstrates the new and inventive ways in which chemistry can be brought to bear on the problems involved in oil production. One highlight of this symposium is the keynote dinner, which always features a challenging speaker. Two years ago the speaker was Nobel Laureate Richard Smalley talking about energy problems. The meeting before that featured a speaker from NASA with the latest information on the international space station. This year proved no exception to the practice of having an intellectually stimulating lecturer.

The speaker this year was Professor John Leinhard, the M. D. Anderson Emeritus Professor of Mechanical Engineering and History at the University of Houston. He is also the author and host of "Engines of Our Ingenuity," a daily public radio series produced by KUHF/FM in Houston and heard nationally on public radio.

His major assumption is that technologists working in a particular field tacitly agree upon an expected rate of improvement, and, as long as that field is active, that rate does not change. If Q_0 is the quality at the time t_0 when motivated improvement of Q begins, then the ratio Q/Q_0 is given by *e* raised to the exponent $(t-t_0)/T$, where *T* is the time constant of exponential growth and defined as L/ln(n). If n is 2, then a working lifetime of 30 years yields: $T = 43.3$ years. What that means is that some process would be expected to double in efficiency over a scientist's lifetime. This implies incremental improvements not involving a new process. For the efficiency of steam engines, the value of *T* from 1740 to about 1850 was 32.7 years with an *n* value of 2.5. Around 1850 new concepts were applied to the steam engine, which caused an acceleration in efficiency. For land and water speed, starting with Fitch's second steamboat traveling at 7 mph in 1787 to the land speed record of around 650 mph in the 1960's, the value of *T* is 41.2 years. The accuracy of clocks from 1400 until the 1920's fit this curve, with an *n* value of 1.96 and a *T* value of 44.1 years. After the 1920's, the mechanical clock was replaced with electrical and atomic clocks, with a corresponding displacement off the previous curves.

Lienhard pointed out that presently these comforting incremental, predictable changes have been superseded by more rapid exponential change. Consider, for

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