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the Alembic

Chair's Corner

We were recently informed about the need to make our Chemistry Department Web pages compatible with software used by the visually impaired. Joe, a friend of mine, is blind and uses his talking computer daily. As a blind person he is able to live independently and engage in a number of activities such water and downhill skiing. I wondered about our fellow chemists who are visually impaired and consulted the publication Working Chemists with Disabilities: Expanding Opportunities in Science. In the publication it is noted that people with disabilities are underrepresented in the sciences. The point of the publication is to highlight some success stories and to make us aware of obstacles people with disabilities face when trying to explore their interest in science.

One of the success stories is about Dr.William Skawinski. Bill is one of approximately 100 blind chemists employed in chemistry. Bill teaches organic chemistry and uses computational techniques and NMR in studying how drugs interact with sodium channels in the cell membrane at the New Jersey Institute of Technology (NJIT). Like my friend Joe, Bill relies heavily on his talking computer, the Internet, and CD-ROM's to access to all kinds of information. Since listening to data tables can be difficult, Bill converts tabular information into Braille. In teaching his course, Bill has students write and diagram on the chalkboard while TA's help with grading and preparing overheads. In the laboratory, Bill is extremely organized and neat. Bill worked with a mechanical engineer Ira Cochin, to help fellow blind scientists by developing "talking" and tactile laboratory instruments. The instruments include a laboratory balance and a spectroscope with audible output. Today, modern laboratory instruments often have digital output and computer interfaces that can aid the visually impaired. Bill also helped other visually impaired people by developing a method to convert 3-D computer graphics into plastic models. Laser stereolithography is a prototyping process that produces plastic models from an image created by computer-assisted design software. During the process, a laser beam traces the shape of an object such as an enzyme receptor site in a container of photosensitive resin. The laser polymerizes the resin forming a plastic model of the image layer by layer. Visually impaired and as well as sighted individuals are fans of the plastic models of enzymes. Many people have difficulty understanding the 3-D spatial relationship displayed on a computer screen. The ability to hold the molecule, to touch and feel the bond angles and relative sizes of the atoms, helps everyone's understanding. This is an example of some of what Bill Skawinski has been able to do at NJIT. According to the article, Bill is happy with NJIT's accommodations for him and his colleagues feel those accommodations are minimal. Bill's story reminded me of how much people can do when given the proper tools.

This is my last "Chair's Corner" and I want to thank all of you who have served our section throughout the year. I hope that next year when Don Showalter asks you to host a meeting or help out with National Chemistry week you are as generous with your time. I look forward to seeing all of you at our next meeting on December 9th in Stevens Point where Doug Moore will tell us about his passion for rocks.

Happy Holidays!

Robin

ACS - CWS
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American Chemical Society

Central Wisconsin Section

"Agate Über Alles"

by

Mr. Doug Moore

UWSP

Tuesday, December 9, 2003

7:00 PM Science Building, *Trytten Lecture Hall*. Room A121

UW – Stevens Point

5:30 Mixer & 6:00 Dinner, Holiday Inn

Banded agate, a semi-precious gemstone and form of cryptocrystalline quartz, surely rates as one of nature's most beautiful and colorful forms. Approximately 1000 varieties of agate are found around the globe, the oldest (ca. 1 billion ybp.) being amygdaloidal agates from the Lake Superior geosyncline. Since Sumerian times, agate has been fashioned into jewelry and other items. The precise diagenesis of agate remains a mystery, although many theories have been advanced since the 1700's. Most prominent has been the work of the German chemist Raphael Liesegang (ca. 1913), and currently the efforts of Michael Landmesser (Univ. of Mainz). The duration of the process, temperature and pressure regimes, crystallization, self-organizing structures and wave-front reactions, geologic setting and petrification may all be fragments of the puzzle.

This slide-illustrated presentation will show why collectors and scientists continue to be fascinated with agate.

About the Speaker

Doug Moore became a "rockhound" for 45 years ago, and developed an obsession with agates in 1996. He and fellow member of the Heart of Wisconsin Gem & Mineral Society, Don Kelman, produced a series of agate slide programs that garnered national recognition. Under the guise of furthering international relations, Moore traveled three times to Germany in the past year, collecting and acquiring agate specimens. He serves as News Photography Program Manager at UWSP, and holds degrees in Natural Resources and Field Biology from UWSP and the University of Michigan.

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Prior to the meeting, a 5:30 PM mixer and dinner will be held at the Holiday Inn, 1510 North Point Dr. (Business 51 North, 4 blocks from UWSP campus). *After dinner, drive south then three blocks east on Fourth Avenue to reach Parking Lot X on campus. The Science Building is adjacent to the lot and the Trytten Lecture Hall is just inside the main entrance.* **Reservations may be made by calling Barb Klein (Chem. Dept. office) at 715-346-2888 (or email bklein@uwsp.edu) by 4 PM on Monday December 8.**

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ACS - Central Wisconsin Section 2003 Meeting Schedule

DATE	LOCATION	SPEAKER	TOPIC	HOST
November 20	Marshfield	Kevin Lang	Monoclonal Antibodies	Dana Haagenson
December 9	Stevens Point	Doug Moore	Agate Über Alles	Steve Bondeson

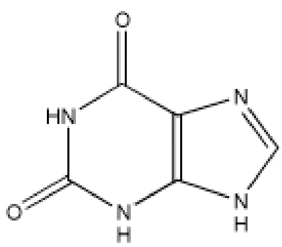
ACS-CWS Web Page

www.uwsp.edu/chemistry/acscws/

Contains up-to-date information about section activities including all issues of the Alembic and meeting notices.

Molecule of the Month

(see the entire collection by visiting www.chemistry.org)



Xanthine is a two-oxygen cousin of adenine and guanine, the purine bases of DNA. Uric acid is a three-oxygen cousin, and methlyated relatives include key ingredients in coffee and chocolate: caffeine and, theobromine. Xanthine combined with its isomer oxypurinol forms an anti-cockroach pesticide that doesn't harm humans.

This Month in Chemical History

Harold Goldwhite, California State University, Los Angeles

In my last column I mentioned the importance that historians of chemistry accord textbooks of chemistry as embodying the accepted views, the paradigms, of the science of their eras. I focused some attention on a text published by Macmillan in New York in 1905, "Outlines of Inorganic Chemistry" authored by Frank Austin Gooch, Professor of Chemistry in Yale University, and Claude Frederick Walker, teacher of chemistry in the High School of Commerce of New York City. The discussion of the atom in that century-old textbook illustrated both recent discoveries, like that of the electron by J.J.Thomson, and a suspicion of the actual physical reality of atoms. In this month's column I will conclude my examination of this interesting textbook, which reveals clearly the state of chemical knowledge expected of students of 1905.

The mole concept is still well in the future for these students. The discussion of stoichiometry is couched instead in terms of equivalent weights or chemical equivalents as the text names the concept. Some of my readers may nod familiarly at this. In my high-school days that's how I learned to explore stoichiometry. I presume that my textbooks were a little out of date! Heat energy changes are expressed in calories and the rule of Dulong and Petit is given in terms of a constant of 6 as the product of the equivalent weight of an element, a small integer or fraction, and the specific heat. Note the omission of the atomic mass in this equation.

The chapter on molecules reflects the ambiguities of the discussion of atoms that I described in my previous column. The authors tiptoe around the question of whether molecules have a real physical existence. They stress that the molecular symbols of compounds, which we would call their molecular formulas, indicate the composition of a molecule of the compound. But while molecular symbols can generally be derived for gaseous compounds, in general no such conclusions can be drawn for pure solids or pure liquids. This leads to a discussion of valence and the introduction of graphic molecular symbols – graphic molecular formulas we would say. Here, too, the authors adopt a non-committal tone. "The symbol H-O-H is a molecular symbol representing the constitution and molecular weight of water in the gaseous condition. We have no right to assume that the molecule of water in the liquid condition or in the solid condition is represented by the symbol H_2O. On the contrary we have evidence in certain physical relations which goes to show that the molecule weight of liquid water at 0^oC may correspond to the symbol $(H_2O)_4$."

Recalling that this text was written before Werner enunciated his coordination theory it is not surprising that the discussion of coordination compounds is in terms of Jorgensen's chain theory. For example the "double" fluoride of aluminium (yes: the European spelling is preferred in 1905) and sodium, $3NaF \bullet AlF_3$ is written as $(NaF \bullet F^-)_3Al$ and the hydrate of aluminium chloride, $AlCl_3 \bullet 6\ H_2O$, "from which no water may be expelled without hydrolytic decomposition of the salt" is shown as $Al(OH_2OH_2Cl)_3$ in which the Cl is separated from the Al by an OO chain.

In no way do I want to suggest, in this look back at an excellent text of 100 years ago, that we are somehow cleverer than its authors. This is an up-to-date book for 1905 with mention of such recently discovered phenomena as radioactivity. "The observation of Becquerel that compounds of uranium emit rays of peculiar properties has led to the discovery, by Mme. Curie, of the element radium, and to the announcement of other unconfirmed elements of similar character, such as polonium by Mme. Curie, actinium by Debierne, and carolinium by Baskerville."

Those of us who write textbooks should hope that readers of 100 years hence will look at our productions and say to themselves "Yes; they were as perceptive in 2003 as Gooch and Walker were in 1905."

Think of many things. Do one.--Portuguese proverb

You don't drown by falling in the water; you drown by staying there.--Edwin Louis Cole

Life is a crisis – so what?--Malcolm Bradbury