CHAIRPERSON'S MESSAGE

"The advancement and perfection of mathematics are intimately connected with the prosperity of the state."
- Napoleon Bonaparte.

"Math will Rock your World". This was the cover story of the Business Week in January 2006. The feature article highlighted how math is now bulling into whole new domain of business and imposing efficiencies of math. The world of mathematical modeling has expanded from modeling material, physical systems, and operation processes to modeling human behavior and workforce performance. Mathematicians are now helping to map out advertising campaigns and changing the nature of research in newsrooms and in biology labs. Mathematical models are being built to predict what music customers will buy and which worker is best equipped for a particular job. Mathematicians have long enjoyed celebrity status in Silicon Valley and on Wall Street. Now they are practicing their trade throughout industries such as consulting, advertising, intelligence and national security, marketing, and media. There has never been a better time to be a mathematician. Top mathematicians are now becoming a new global elite. I remember how difficult it was to explain to school students why they should be studying math and what applications math can be used for. We do need to highlight these new frontiers to our children. Learning math opens new doors in the job market. The challenge facing the US is that we must breed more top-notch mathematicians at home. This will require revamping education, engaging more girls and ethnic minorities in math. It also requires extending the math curriculum to include more applied subjects as statistics. We, as engineers, can also support this effort. There are a lot of examples of the use of math in our daily engineering life. We can communicate and illustrate these examples to the math teachers and school students in our communities.

Sam Salem
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Engineers Week 2007

The Foundation for Engineering Education, Inc.
presents
in cooperation with ABCD, ACI, AIA, ASCE, AIChE, ASME, ASHRAE, IEEE, NYACEC, NYSATE, NYSSPE, SAME, SWE

ENGINEERING: Improving Today for Tomorrow
A Celebration of National Engineers' Week in the Capital District

Albany Marriott, 189 Wolf Rd., Albany
Two Full Days of Seminars with PDHs offered - 8:00 A.M. to 5:00 P.M.

THURSDAY, **February 15, 2007:** Albany Marriott
Limited Exhibitors 8:00 A.M. to 5:00 P.M.

Keynote & Award Luncheon 12:00 P.M. to 1:30 P.M.
Keynote Speaker: **Albany Mayor Gerald D. Jennings**

Order of the Engineer (tentatively scheduled): 4:00 – 5:30 pm
A "Ring Ceremony" during which engineers accept the "obligation of an Engineer" to serve the public.

Followed by a **Reception & Dinner** - 5:00 to 8:30 P.M.

FRIDAY, **February 16, 2007:** Albany Marriott
Exhibitors 8:00 A.M. to 5:00 P.M

Keynote Luncheon 12:00 P.M. to 1:30 P.M.
Keynote Speaker: **Paul Tonko, Assemblyman**

For further information on exhibiting, advertising, schedule, registration and/or for ticket purchase, contact Jennifer Miller, E-Week Coordinator @ (518) 283-7490 or jamiller@nysspe.org

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On the web at:
http://www.ieee.org/schenectady

Rewarding Service

Schenectady Section has two award recipients on this list this year. Rebecca Nold and Kristin Short have received the 2006 Region 1 Award for "Outstanding service to the IEEE Schenectady Section and for major contributions to the Industry and the Community".

Our thanks to both Kristen and Becky for their many years of valuable service to the local section. These awards only scratch the surface of the valuable contributions they both have made, taking time from busy schedules and raising families to give their time and talents for us.

— Call for Contributions —

The Current Source is always open for contributions for future newsletters. There is certainly much more going on in this area then gets profiled in the newsletter. Do you have an article about a historical moment, a future event, or a notable discovery that might be of interest to the local IEEE community? How about a picture of some momentous occasion? Please contribute! Staff editors can even take your bulleted list and turn it into printable article if writing does not appeal to you. We do however have to reserve the right to refuse any material of a commercial nature.

The Current Source is published twice a year by the Schenectady Section of the IEEE. If you are interested in volunteering for The Current Source or wish to submit material for consideration, please contact the editor.

Historical Tidbit

This year (2006) is the centennial of the first Amplitude-Modulation (AM) radio broadcast. (FM came along later). It was a demonstration of radio broadcast technique to an oblivious world and is now mostly forgotten. Mr. Reginald Fessenden conducted the demonstration of radio braodcast at 9:00PM on Christmas Eve (Dec. 24) of 1906, and it was repeated one week later on New Years Eve.

COMMUNICATION ACROSS THE ATLANTIC
An historical perspective of technical innovation

The Schenectady Museum & Suits-Bueche Planetarium hosted a joint IET/IEEE event in September on early cross Atlantic communication. The lecture happened to correspond to the re-broadcast on WMHT of the piece titled "American Experience - The Great Transatlantic Cable." Dr. Donard de Cogan, one of the speakers, was one of the presenters in that PBS broadcast. The Friday night lecture, by Brian Bowers, was heavily focused on the interaction with Albany's own Joseph Henry and Michael Faraday in the early part of their careers. Significant scientific collaboration took place across the Atlantic. With the exception of one visit while they were young enough to risk the rigors of travel by sailing ship, their work was carried out almost exclusively be hand written letters.

As described by Donard de Cogan on Saturday, the communication increase due to the transatlantic cables allowed greater opportunities. The original history of the cables and the societal changes they eventually introduced were amazing. Although wireless telegraphy and experimental voice (telephony) broadcast reached European shores before 1906, it was a few more years before radio messages were commercially communicated across the Atlantic. As detailed by Ed Owen, the scientists and inventors at GE-Schenectady had a strong influence on this in the early days, inventing or improving large portions of the enabling technology.

Excerpt from lecture delivered on 15 September 2006
By Brian Bowers

In the first half of the nineteenth century researchers on both sides of the Atlantic were studying the nature and properties of electricity. Their

Donard deCogan, Ed Owen and Brian Bowers

work was published in various journals but there was little scope for real co-operation until the Atlantic cable made rapid communication possible. In 1837, however, the Americans, Henry and Bache, visited London and worked with Wheatstone and Daniell on a current scientific topic.

Introduction

Nearly forty years ago I was reading a paper describing the latest advances in electrical science, and a passing remark caught my attention. It gave me the idea for this paper, although the idea has lain dormant most of the time since. At the time I was working on my biography of Charles Wheatstone, and the paper I was reading was one he wrote in 1837. Wheatstone was describing some investigations into the fundamental nature of electricity. He described work done by a couple of Italian scientists and then his own confirmatory experiments, conducted at King's College London where he was Professor of Experimental Philosophy or, as we would say now, Experimental Physics. Then came that passing remark: 'Professors Daniell, Henry, and Bache assisted in the experiment.' Daniell's presence is easily explained, but how did two Americans come to be involved?

Let us try and cast our minds back

before the first attempt to lay a cable across the Atlantic, in 1857. The word 'early' in my title means before the Atlantic telegraph cable. Scientific research into electricity had been going on for many years before 1857, and on both sides of the Atlantic. The scientific journals, and a few books, were regularly dispatched across the Atlantic, in both directions, but how much were researchers on one side really in touch with researchers on the other? How often did they get together? We are used to communicating instantly with colleagues from all round the world, and sometimes visiting them. In the first half of the nineteenth century it took months to send a letter to a colleague across the Atlantic and get a reply. Real co-operation in research was difficult, if not impossible.

Was there any significant transatlantic co-operation in electrical research? Did British and American researchers ever get together? The invitation to speak at this meeting encouraged me to pursue the question. Here we have two English professors and two American professors working together in the same laboratory. How often did that happen? The Archives of the IEEE in London have many papers of workers from the early nineteenth century, but I could not find any other examples of such transatlantic co-operation. I tried the (American) Center for the History of Electrical Engineering, but they also had nothing relevant. I conclude that the meeting between Wheatstone, Daniell, Henry, and Bache was unique - though if anyone can find another example I should be delighted. ∎

DR. WILLIAM WULF - STEINMETZ MEMORIAL LECTURE 2007

By Cherrice Traver

The 67th lecture in the Steinmetz Memorial Lecture series will be held on April 16, 2007 at Memorial Chapel on the Union College campus. This year's distinguished lecturer is Dr. William A. Wulf, president of the National Academy of Engineering.

William Wulf is described by his peers as "a "pioneer," "a Renaissance Man" and "one of the premier computer scientists in the whole world". He has led efforts to educate policy makers and the public about the importance of engineering in our society. In his speech to the American Society of Engineering Educators he notes that when people are asked to name the important events of the 20th century, they "…respond with the list of wars, the great depression…if one contrasts the life of an average citizen in 1898 with that in1998, the profound differences are all the result of the technology produced by engineers."

As President of the National Academy of Engineering, Dr. Wulf has urged reform on several fronts to ensure a prosperous future for the United States. In his remarks at the Annual Meeting of the National Academy of Engineering he concluded:

The United States is enormously prosperous, in no small measure because of the innovative contributions of engineers. In the process of developing the very technologies that have made us prosperous, however, we have also enabled others to compete with us on a more level playing field. This is generally a good thing, because a rising tide lifts all ships, and a more prosperous world will surely be a safer world. But the strategies that helped us get to the top are not the ones that will lead us to greater security, prosperity, and health in the future. As difficult and uncomfortable as it is, we must change—and we must do it before it is too late. Some of what needs to be done is under our control, or can be influenced by us. Therefore, it's time we got started. Like NOW!

Dr. Wulf has had a distinguished professional career that has included positions in academics, industry, and public service. He received his BS and MS degrees from the University of Illinois. He did his doctoral work at the University of Virginia where in 1968 he had the distinction of receiving the first PhD degree awarded in Computer Science at the University. From Virginia he went on to Carnegie-Mellon University where he progressed through the ranks from assistant to full professor in the Computer Science department. Dr. Wulf, and his wife, Dr. Anita Jones, left Carnegie-Mellon in 1981 to start up Tartan Laboratories, a company that developed optimizing compilers. He was Chairman and Chief Executive Officer at Tartan until 1988. He then served for two years as the Assistant Director of the National Science Foundation as head of the Computer and Information Science and Engineering directorate. Dr. Wulf returned to the University of Virginia in 1990 where he is the AT&T Professor of Engineering and Applied Science and holds the highest faculty position of University Professor. He is currently on leave from the University of Virginia to serve in his role at the National Academy of Engineering.

Dr. Wulf's research interests are on the hardware/software interface (including programming systems and computer architecture), scalable high performance memory systems, computer security, and hardware-software co-design. He designed the systems-implementation language Bliss, and was on the team of architects who designed the legendary DEC PDP-11 minicomputer. He also designed and constructed the C.mmp multiprocessor, the Hydra operating system, a technology for the automatic construction of optimizing compilers (PQCC), and the WM pipelined processor. He has written over 100 technical papers and reports and three books, and holds 2 US Patents. He is a Fellow of the ACM, the IEEE, the AAAS, and AWIS. ∎

PAST SECTION EVENTS

Oct. 23-25
Gideon Putnam
IEEE Conference on the Convergence of Technology and Professional Communication *(IPCC 2006)*

Oct. 20
Brandon's
Silicon Carbide Power Devices for Energy Conversion Applications

Sept. 15-16
Schenectady Museum
Communication across the Atlantic

Sept. 11
New York ISO
Overview of NYISO's Control Room

June 8
Brandon's
Career Survival in the New Millennium

May 19
Brandon's
Relieving Transmission Constraints with Dynamic Thermal Line Ratings

Lunch events are held on average once per month, typically at Brandon's in Schenectady. Most of you are receiving notices electronically for every event. If you are not, please update your profile on the IEEE website. Events are also advertised on the local Section website at http://www.ewh.ieee.org/r1/ schenectady/events.html. Please check often! Reservations are required due to the cost of the lunch (as paid by the Section). All events are free for IEEE members who RSVP by the deadline, $10.00 for non-members and all who fail to RSVP by the deadline stated for each event.

IEEE SECTION VOLUNTEERING DEMYSTIFIED

By Rebecca Nold

Just how and why does the local IEEE Section work? The IEEE reaches its members through two channels: technical channels, such as the societies and conferences, and through the geographic channel. The Section is part of the geographic channel: it's close to you. The goal of the Section Executive Committee is to bring value back to you by providing local services using dues returned to the Section by the IEEE. The local services are mostly, at this time, lunchtime talks with a complimentary lunch. We are also involved in some student activities, joint Professional Engineering events, and we hope to add career training. Ideas are welcome.

Activities in the local Section are planned by a combination of the Executive Committee, Society chapter chairs and committees, and a number of appointed officers. The responsibilities and methods for election or appointment are outlined in the Schenectady Section Bylaws, available upon request.

Elected Officers

We have wonderful volunteers (!) and just enough of them. Usually there is only one volunteer for each available office. In the past (before 2001) we would mail out 1200 ballots to our members, showing a slate of people willing to serve. Usually we would get 20 to 30 ballots back with check marks next to the one person listed for each office. To save volunteer energy and your dues, uncontested nominations for office are now elected by acclamation. Through this process the nominees for the coming calendar year are announced in a newsletter in late summer or early fall. If there is no comment back from the membership, the nominees are once again announced at the December lunch-

eon and considered elected at that time.

In general the officers on the Executive Committee and the Power Engineering Society Committee serve a year in each office. They typically rotate up through the various positions and eventually become section chair. The executive committee is considering a two-year commitment for the office of treasurer to make better use of the learning curve involved in keeping the accounts and making reports. As a result of this, the treasurer will not automatically proceed into the Section Chair position. In 2007 the nomination for treasurer is Kristin Short who is serving as Past Section Chair in 2006.

Appointed Officers

There are a number of appointed officer positions in the Schenectady Section. The Section Executive committee approves these people. They do not serve a pre-defined term.

There is also a Steinmetz Committee which works with the chair to find the lecturer and arrange the event.

Any of the appointed chairs or Society chapter chairs would welcome interested people to help with programming ideas!

Responsibility

In summary, it takes people to make the Section work! We have a comparatively active section and it is because people have picked up the phone to volunteer, or said yes when asked to volunteer. Most find that working with the other committee members is very rewarding – making contacts with others outside their immediate place of business. The time commitment can be slight, just a few hours a month can really make a difference.

For contact information on our officers, see http://www.ewh.ieee.org/r1/schenectady/whoweare.html. ∎

2007 Slate of Officer Nominations

Elected Officers:

Executive Committee
Section Chair - Shadrack Orero
Treasurer - Kristin Short
Secretary - Peter Sutherland
Membership - Zonqui Sun (Sonnie)
Past Section Chair - Sam Salem

Power Engineering Society
Chair - Jose Diaconti
Secretary - Saber Azizi
Programs - Antonio Caiafa
Membership - Chandra Reis

Computer Chapter Society
Chair - Howard Halstead
Secretary - EMPTY
Programs - EMPTY
Membership - EMPTY

Industry Applications Society
Chair - Ed Owen
Secretary - EMPTY
Programs - EMPTY
Membership - EMPTY

Computational Intelligence Society
Chair - Neil Eklund
Secretary - EMPTY
Programs - EMPTY
Membership - EMPTY

Electron Device Society
Chair - Kevin Matocha
Secretary - EMPTY
Programs - EMPTY
Membership - EMPTY

EMBS
Chair - Judy Kilday
Secretary - EMPTY
Programs - EMPTY
Membership – EMPTY

Appointed Officers:

Steinmetz Committee Chair
    Cherrice Traver
PACE (Professional Activities) Chair
    Zonqui Sun
Student Activities Chair
    Shane Cotter
Newsletter Coordinator
    Chandra Reis
Section Historian
    Chandra Reis
Nominating Chair
    Rebecca Nold
Membership Meeting Coordinator
    Lou Tomaino
Awards Chair
    Ricardo Austria
Liaison to Professional Engineering Society
    Jose Diaconte

Past, Present, Future: New EMBS Chapter in Schenectady

This column has been focusing on the history of engineering in this area for most of the last issues. This issue we take a moment to look at one area of the future. EMBS stands for Engineering in Medicine and Biology.

The EMBS is a technical society with a focus on the application of engineering to problems in medicine and biology. As a society it is not new; EMBS has been serving the needs of Biomedical Engineers throughout the world since the early 1950's. The field of interest of the Society is the application of the concepts and methods of the physical and engineering sciences in biology and medicine.

This covers a very broad spectrum ranging from formalized mathematical theory through experimental science and technological development to practical clinical applications. The biomedical engineering community includes engineering in medicine and biology, neural systems and rehabilitation, information technology in biomedicine, nanobioscience, medical imaging and neural networks. It includes support of scientific, technological, and educational activities.

The Society publishes the following Transactions and Magazine:

- IEEE Transactions on Biomedical Engineering
- IEEE Engineering in Medicine and Biology Magazine
- IEEE Transactions on Neural Systems and Rehabilitation Engineering
- IEEE Transactions on Information Technology in Biomedicine
- IEEE Transactions on Nanobioscience

In collaboration with other societies it also publishes:
- IEEE Transactions on Medical Imaging
- IEEE Transactions on Neural Networks
- IEEE Transactions on Pattern Analysis and Machine Intelligence.

The Schenectady Chapter of the IEEE EMBS is in phase 4 of chapter development. The Schenectady chapter petition is signed and approval from the main office is confirmed. It is time to look for founding chapter officers to fill the positions Vice Chair, Treasurer, and Secretary. Nominations and volunteers can send an email to Judy Kilday at kilday@alumni.union.edu.
More information can be found at http://embs.gsbme. unsw.edu.au/info.html ■

DATE-SENSITIVE MATERIAL

IEEE