AIP Matters

Monday, May 17, 2010

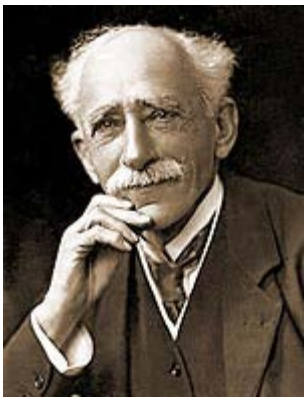
Director's Matters

By H. Frederick Dylla, Executive Director & CEO

Invention and discovery

When it comes to scientific progress, many factors come into play: necessity, opportunity, resources, timing, and even luck. Yet perhaps most vital to science advancement are the drive, ingenuity, and influence of brilliant individuals. Learning about the history of an invention or a discovery gives insights into its genesis. The learning experience is enlivened by the personalities of the inventors and innovators.

While conducting research for an article I was writing about the birth of electronics (*Journal of Vacuum Science and Technology A*, volume 23, page 1244, 2005), I became intrigued by John Ambrose Fleming, a remarkable inventor about whom I knew little despite the impact of his invention. Fleming invented the vacuum diode in 1904, which was the first efficient detector of radio waves and thus launched the first half century of electronics built around the radio industry.

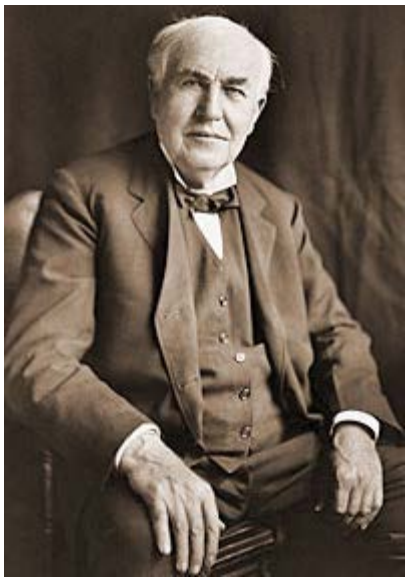


British electrical engineer John Ambrose Fleming invented the thermionic valve. Hulton-Deutsch Collection/ Corbis.

As he began a long career as the first professor of electrical engineering at the University College London, Fleming worked for the Edison Electric Light Company and the Marconi Company. Because Fleming was comfortable working both in the scientific/academic environment as a researcher and professor and in the technological/commercial realm as an engineer and business consultant, he became a pioneer of the cross-sector collaboration that is so often fruitful.

Fleming's invention of the vacuum diode was based on the work of the world's most prolific inventor, Thomas Edison, who in 1882 introduced a wire into one of his newly invented incandescent lamps. Edison noticed that a current was transmitted to this extra wire from the lamp's filament. Just three years after he had demonstrated the first practical incandescent lamp, Edison designed, financed, installed, and began operating a fully functional electrical power system in lower Manhattan.

In this short period, he figured out how to manufacture light bulbs in quantity, design and



Thomas Alva Edison, 1922.
Library of Congress.

build steam power generators, and lay more than 14 miles of electrical cable to distribute power to customers. Edison built efficient electric motors and a whole array of ancillary components that contributed to the power system's functionality—switches, lamp holders, fuses, power meters, and so forth.

In addition, Edison financed the whole project himself, successfully marketing the new energy source against the established energy providers (gas companies), and fought a corrupt city hall (Tammany Hall). The entrenched interests would not have bet on Edison's original venture of the incandescent lamp, but less than 20 years later, more than 2000 operating power stations had been built in the US, and General Electric (the company that Edison founded), Westinghouse and Western Electric were major manufacturers of electrical products. Harold Evans's book *They Made America: From the Steam Engine to the Search Engine* (Little, Brown and Company, 2004) celebrates the American inventor and takes particular notice of Edison's talents.

The science frontiers and engineering challenges of today's highly interconnected world normally require teams of talented people to work collectively. In this post-industrial age, significant impact by a lone inventor or a small entrepreneurial team may seem unlikely. However, in my lifetime I have witnessed James Watson and Francis Crick's discovery of the structure of DNA unleash the new field of molecular biology, Norman Borlaug's development of wheat strains help feed millions across the globe, and Bill Gates's software system and resulting mega-company make the personal computer a household commodity. Members of scientific societies need to celebrate the impact of the dedicated entrepreneur and help nourish the environment that breeds such entrepreneurs.

Thomas Edison's first successful light bulb model, used in public demonstration at Menlo Park, December 1879.

AIP's History Center is in the midst of a project to capture the history of physicist entrepreneurs. We hope to gain a better understanding of how entrepreneurs succeed in shepherding physics-based technology from research to invention to products in the marketplace.

PUBLISHING MATTERS

Beijing office update

Robert Harington, Publisher of AIP Partnerships, and Mark Cassar, Publisher of AIP Journals, embarked on an April visit to AIP's newly opened China office in Beijing. Xingtao Ai (right), AIP Global's new chief representative in China, introduced Robert and Mark to a wide array of high-profile physical scientists in Beijing and beyond. The team received a warm welcome and many cups of tea from scientists eager to discuss Chinese science and to know more about AIP activities in China.

The office is in an inviting and functional space, centrally located near the Institute of Physics of the Chinese Academy of Sciences. The stage is set for many a repeat visit as AIP embraces the depth and breadth of the science and scientists in China.

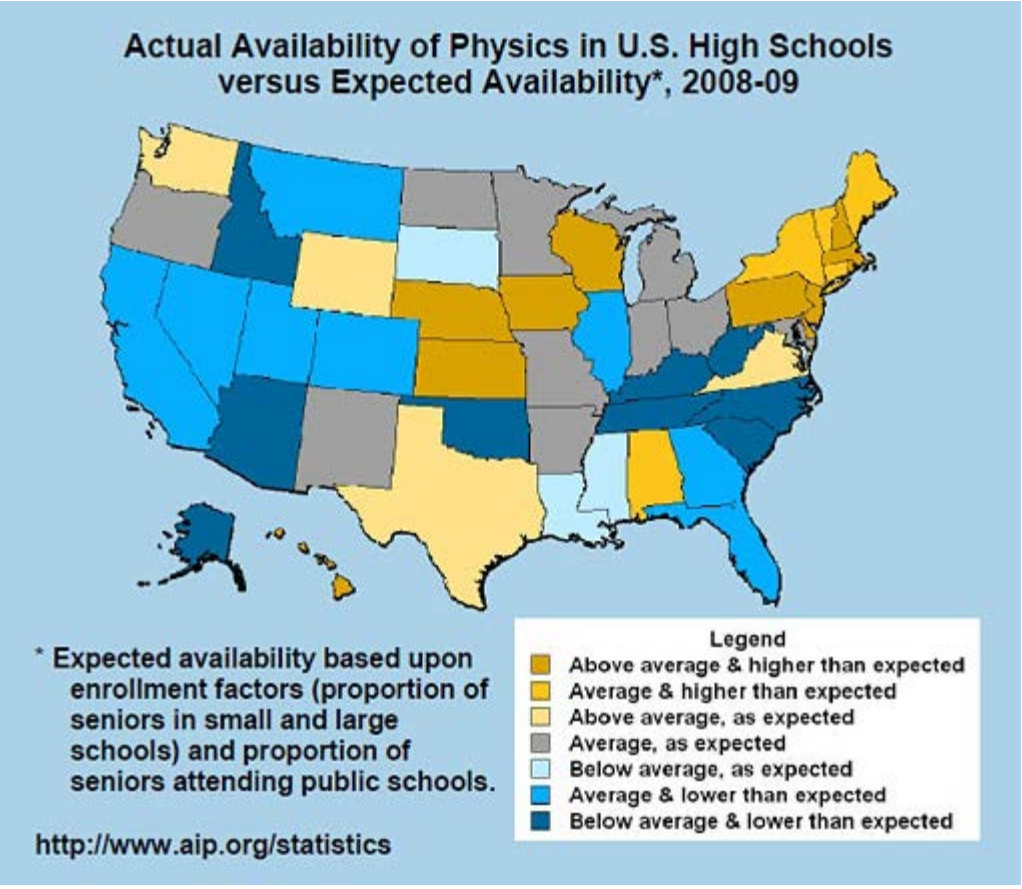
Ai reciprocated last week with visits to AIP's Melville and College Park offices, where she had a chance to meet many colleagues and learn about AIP's programs and services in order to help identify those offerings that may be of interest to the Chinese scientific community.

PRC MATTERS

focus on high school physics

High School Physics Availability is the latest ***focus on*** published by the AIP Statistical Research Center (SRC). In this first report from the 2008–09 Nationwide Survey of High School Physics Teachers, SRC examines student access to physics. About 92% of high school seniors attend a school where physics is offered every year, and only 4% attend schools where physics is not offered. The report examines, by state, two factors that affect whether or not physics is offered: (1) the size of the school (larger schools being more likely to offer physics) and (2) whether the school is public or private (physics being more prevalent in public schools).

Read the full report



Media abuzz with acoustics

AIP Media and Government Relations (MGR) teamed up with the Acoustical Society of America to provide media services in support of the society's 159th meeting, which took place April 19–23 in Baltimore, MD. For the 10th straight year, MGR promoted interesting research developments presented during the talks and events through press releases and Inside Science News Service (ISNS) reports.

The efforts generated news coverage from ScienceShot, Discovery News, Science News, MSNBC, Yahoo! News, the *Baltimore Sun*, and the *Philadelphia Inquirer*. At the meetings of the ASA committees on public policy and public relations, MGR staff reported on the recent AIP endorsement of ASA's public policy statement on classroom acoustics and on another successful year of Discoveries and Breakthroughs Inside Science, media services work, and the ISNS partnership with the *Journal of the Acoustical Society of America*.

To celebrate ASA's first year as a partner with the congressional fellowships program, AIP arranged for AIP-ASA Congressional Fellow Jeffrey Fox to participate and meet with ASA leadership. Fox just completed his fellowship in the office of Senator Jeff Bingaman (D-NM).

Fox and AIP's Senior Government Relations Liaison Jennifer Greenamoyer spoke at a workshop on fellowships and grant writing, organized by the ASA Student Council. Greenamoyer advised students on how to apply for the AIP-ASA congressional fellowship and the SPS internships, and Fox talked about his experience working with Congress over the past year.

John Boyle from Brigham Young University (shown at left with SPS Program Coordinator Kendra Rand) attended the meeting as the official SPS student reporter. His account will offer a student's perspective and will soon be available on the SPS website.

AROUND AIP

In case of emergency

At this time each year, employees are asked to visit the Employease Network to verify their emergency contacts. After logging on, navigate to the "Personal" tab and select "Emergency Contacts" to review, verify, or update the information. This information is vital for AIP's business continuity plan. For log in and password assistance, please contact Janet Wehrenberg in College Park or Laura Cannillo in Melville.

THIS WEEK

- CLEO/QELS: 2010, May 16-21 in San Jose, CA – See the special LaserFest Symposium – Celebrating the 50th Anniversary of the Laser
- Bike to Work Week, May 17-May 21

Events at ACP (College Park, MD)

- Monday, May 17 – Brown bag lunch/talk on biking to work, 12pm
- Thursday, May 20 – University of Maryland Materials Research Science and Engineering Center's Student Science Conference
- Friday, May 21 – Bike maintenance clinic, 12pm

We invite your feedback to this newsletter via email to aipmatters@aip.org.

For past issues of this newsletter, visit the AIP Matters archives.