Semi Wet, Semi Dry, or Semiconductor?

Even before the establishment of our formal divisional structure, the Society represented a very diverse technical scope that included both wet (a reference to electrochemical science and technology) and dry (a reference to solid-state science and technology) scientific interests. In 1921, we saw the formation of our first wet divisions with technical interest in areas such as "Electrothermics & Metallurgy" and "Electrodeposition." A decade later, the Board approved the establishment of the Electronics Division, which was formed exclusively to support three dry technical interests: general electronics, fluorescence, and rare metals. Regardless of the differences in their technical scope, both the Society's wet and dry divisions have been supporting the semiconductor industry for a long time.

The wet divisions were not always considered a partner in the semiconductor electronics industry, but in the words of John Stickney (current chair of the Electrodeposition Division), "the electronics industry has accepted electrodeposition as a full-fledged member of its construction tool box." For example, electrodeposition is being used for the formation of hard disk heads, and for forming the tiny wires that connect transistors in ultralarge scale integration for the formation of microprocessors. It also took some time for the Electronics Division to be recognized. Despite successful symposia in their three interest areas in the 1930s and 1940s, it was two decades before the Division started to grow. It was Bardeen, Brattain, and Shockley's invention of the transistor in 1947, and the subsequent birth of semiconductor electronics, that enabled the accelerated growth of the Electronics Division, along with many other technologies and industries including biotechnology, nanotechnology, software, and the Internet. Over the past fifty years the ECS Electronics Division, along with our Dielectric Science & Technology and High Temperature Materials Divisions, became the haven for scientists and engineers working in the chemistry of semiconductor electronics materials and processing technology.

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We have featured articles on semiconductor electronics in this issue of *Interface* that should interest all ECS members, and which may be of particular interest to members on the "dry" side of the Society. Since the early 1950s, our dry side interests have represented a major part of the ECS membership and our publishing and meeting activities. Although ECS is a natural home for semiconductor materials and process scientists and engineers, many people outside the Society have not made that connection. People within scientific communities and among the general public do not often realize that the semiconductor industry is, in a very real sense, a chemical industry, and semiconductor electronics is produced by an electrochemical process. In the early 1950s some scientists, namely, Frank Biondi and Robert Burns of Bell Laboratories, made that connection and led efforts to persuade semiconductor materials and process scientists and engineers to consider the Society as their primary home. The first semiconductor sessions were held at the 1953 ECS spring meeting in New York. Over the past 20 years, manuscript and abstract submissions in these areas have increased steadily, but maturation of the industry and changing support for research and development in the physical sciences have made it more important than ever to sustain this connection between the Society and the semiconductor industry. ECS has taken many steps to increase the recognition of our solid-state—or dry electrochemistry—interests. The most significant step occurred in May 2000, when we officially adopted what had become the *de facto* acronym, "ECS." We also adopted the use of a tagline, "the society for solid-state and electrochemical science and technology," for the purpose of broadening our recognition beyond the traditional meaning of the word electrochemistry.

In May 2005, we will continue educating the world about our involvement in the field of semiconductors, when we combine with the Chemical Heritage Foundation (CHF) and the Eastern Technology Council to present a symposium honoring the 40th anniversary of Moore's law. This symposium, entitled "Moore's Law at Forty: Chemistry and the Electronics Revolution," will be hosted by CHF in Philadelphia, Pennsylvania, May 12-13, 2005 (see the information on page 23). The symposium will include presentations from a number of prominent figures in the semiconductor industry including ECS member Gordon Moore, who will give his perspective on where we are, where we have been, and where we are going. Dennis Hess, an ECS past president and current Editor of Electrochemical and Solid-State Letters, will also be participating as a symposium moderator.

Gordon Moore became a member of ECS in 1957 and was a cofounder of both Fairchild Semiconductor and Intel Corporation. Moore's "law" came about, *ca.* 1965, when Moore saw that the number of transistors per square inch on an integrated circuit would double every year (later revised to 18 months), effectively giving semiconductor electronics the potential to double in power every two years or so. History, and the Herculean efforts of the men and women of the semiconductor industry, have proven Moore correct. Today, global change marches to the beat set by the technology behind Moore's law.

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