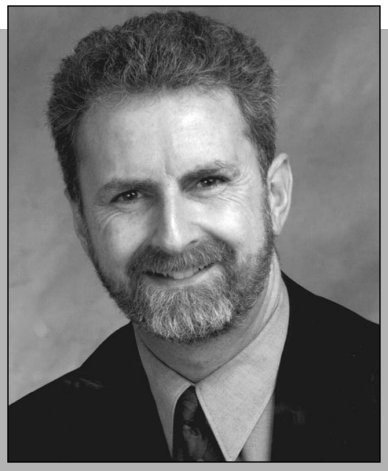
Industrial Strength



"Since industry uniquely serves the purpose of converting research findings into economic growth, a strong connection to industry is essential."

Alex King

Last month in this column, I commented upon the ways in which the Materials Research Society reflects change in our field through the programs of its meeting. This month, I am concerned with the changes in who participates. MRS membership is provided as a benefit to those who attend our meetings, so the membership is a good measure of who is attending. In recent years, we have seen membership growth in many sectors—academic, U.S. national laboratories, and members based outside the United States—but there has been no growth in our industrial membership for several years, so the percentage of industrial participation is declining.*

This concerns me, because unless the findings of research are put to use in real products, they have no impact. Since industry uniquely serves the purpose of converting research findings into economic growth, a strong connection to industry is essential.

In its early years, which were really not so long ago, MRS's industrial membership was dominated by a few very prominent industrial labs, including IBM and Bell Labs, and a number of similarly well-known names. These labs reflected the faith of industry that good research could be turned to the benefit of the company, and researchers had open mandates to pursue what interested them. As pointed out by IBM's then vice president for science and technology, John Armstrong, in an MRS Fall Meeting plenary address† in 1992, this model only works to the company's benefit when the technology is relatively immature and the learning curve is steep. A small advance in knowledge then produces a significant competitive advantage. As the learning curve flattens, however, expensively won knowledge diminishes in value. The learning curve for silicon metal oxide semiconductor technology flattened noticeably in the 1990s, and IBM, Bell Labs, and many other industry-based research powerhouses began to shrink.

Large, well-resourced, industrial research laboratories may or may not soon be a thing of the past, and it is far from clear that industrial research on materials is in decline. However, it does seem that the model is changing. More and more of the cutting-edge industrial research is being done in small start-up companies devoted to the development of a single technology. They are not funded by corporate largesse, but by targeted venture capital, and in most cases, their prospective customers are corporations rather than individuals. The examples are all around us, such as technologies for displays or batteries or detectors that are bought to be integrated into systems to be sold under familiar brand names.

Small companies responsible for a growing share of the industrial research sector are often spinoffs from universities or national labs, just as the original semiconductor companies that sprang up in Silicon Valley were spinoffs from Stanford and a few other universities. There is also a significant component of small, single-technology companies created by alumni of the old "big-time" industrial labs. The modern equivalent of the legendary garage in which Hewlett-Packard was founded is typically a university-owned "incubator" in a research park close to the campus.

The needs of researchers in this new environment differ from those of the glory days of IBM and Bell Labs. Their tiny budgets and staffs, and constant deadline pressure, cannot always support attendance at technical conferences like MRS meetings. Perhaps the researchers in these companies (who are often the CEOs and custodial staff, too) get some of the technical information they need through their university interactions, but I am concerned about the loss of this group from the discourse that MRS supports and encourages.

We have taken some steps to meet the needs of the new generation of corporate researchers by creating focused workshops as an alternative to our spring and fall meetings, by delivering more information via our Web site, and through our publications. The TECHNOLOGY ADVANCES section of *MRS Bulletin* has generated some very positive feedback from industrial researchers who have used it to connect to research germane to their own work, and we continue to strive for further new ways to respond meaningfully to a changing landscape for corporate research.

I invite you to join in a discussion of ways in which MRS might serve the needs of its industrial-based members. If you have an unmet need, or an idea in this area, I invite you to write to me, or write a letter to the Editor of *MRS Bulletin* for publication. A serious dialogue about MRS's role in facilitating communication for corporate researchers is essential to meeting the needs.

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*For a discussion on MRS membership trends, see LETTER FROM THE PRESIDENT in *MRS Bulletin*, December 2001, page 963.

†For an article based on the plenary address, see *MRS Bulletin*, February 1993, page 4.

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