# Materials Science: You Mean Like Clothes?

"You mean, like clothes?" I imagine that at least some of you have received this response to your admission that you were a materials scientist. I prefer it to being mistaken for a materialist, which has also happened to me once. My latest encounter took place on a transatlantic flight, where I engaged in conversation with a very pleasant man who was, perhaps, 10 years my senior. After the obligatory exchange of pleasantries and itineraries, he told me he was a medical doctor, an academic at that. (How did he wind up in coach with me? Can't he afford First? Would I send my mother to him?). I cringed when my turn came, because I knew he would be puzzled by the name of my profession. He was, and I had to cut him off, so as not to laugh and embarrass him, at "You mean, like..." It's unfair, I thought. He can talk to anybody about his profession, and bond instantly. I have to prove to people that I'm neither greedy nor in the rag trade before I can tell them how wondrous my chosen profession really is. Many don't make it through the explanation.

*". . . materials are the 'stuff' that humankind finds useful for the betterment of civilization."*

Martin Gruen

Once I had his attention, I recited the litany. I told him that materials are the "stuff" that humankind finds useful for the betterment of civilization. I pointed out the many encounters he has with advanced materials on a daily basis. He was impressed to learn that materials are so important to society that entire stages of human development have been named after the most technologically advanced materials available at the time. "What age are we in now?" he asked. Of course I told him "Silicon," and continued that it would probably be "Biomaterials" before too long. I held his attention until we approached the Irish Coast. I think I lost him when I explained why we need a national Bagel standard, a favorite tangent of mine. However, I did succeed in educating him about materials science.

This episode would be really funny if it weren't a symptom of a significant problem. How is it that a well-educated medical research professional doesn't even recognize materials science as a field? Why doesn't he know that his NMR imaging machine, which daily pulls off medical miracles, is also a physics and materials science tour de force? After all, we all know (unfortunately) what cancer is. I think at least two problems plague us here. First, nothing gets people's attention like their physical well-being. The other problem is that the average person is not fluent enough in science and engineering to identify with our field. It is not that our field is hard to relate to; as I've mentioned, a few simple statements will turn on the light bulbs in the lay person's head. We have not tried very hard to educate the public in the past. It is very important that we not continue to make that mistake.

Figure 1 shows federal research spending trends for the last 30 years. Notice that the life sciences (e.g., biology and medicine) have succeeded in lassoing an ever-increasing amount of federal research dollars, whereas the physical sciences and engineering have been virtually flat for decades. Life sciences have been very successful, not only because of their high visibility to the lay person and legislator alike, but also because they have been very well organized in their lobbying, fund raising, and public outreach efforts.

I want you to know that your Materials Research Society (MRS) has not been idle in this regard. I'd like to tell you of a major effort called Materials MicroWorld, that highlights our leadership in bringing materials science to the public. Materials MicroWorld is a unique science education outreach effort initiated by leading materials scientists and engineers in partnership with MRS, the National Science Foundation, and local science museums. Many prominent members of MRS are actively involved. The Materials MicroWorld initiative will "Bring Materials Science to Life" for millions of students and adults. The program will create unique and exciting interactive exhibits

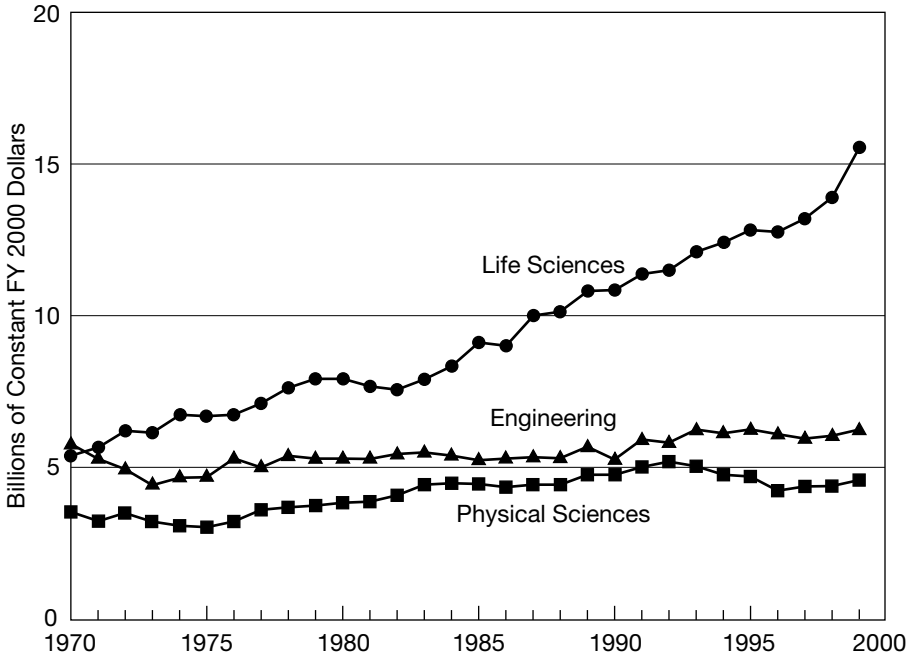


*Figure 1. Trends in federal research by discipline, FY 1970–1999. From the American Association for the Advancement of Science web site: www.aaas.org.*



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for national travel, thus promoting public understanding of basic scientific principles, issues, and trends in materials research and engineering. It is expected that the exhibits will be seen by about 4 million people within their first three years of national distribution. Materials MicroWorld will invite people of all ages to explore how microscopic structures affect materials behavior, and will primarily target middle school audiences (grades 5–9, ages 9–15 years). It is hoped that the exhibits will create enhanced awareness of the direct connection between materials science and modern technology.

One of my professors said that you don't understand anything that you can't explain to your grandmother. Actually, our field is readily understandable by the grandmothers, legislators, English teachers, and bus drivers of this world. They all have the intelligence and intuition to see the connection between their lives and materials technology—we have only to point it out to them. Materials MicroWorld is a grand effort at doing that. However, every one of us can do it on a smaller scale, on a daily basis. Many of us spend lots of time on airplanes. I suggest that we request center seats so that we can reach out to people two at a time.

MARTIN L. GREEN
2001 MRS President



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