

Funds for engineering research crucial to economy, key to future

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"Between my two visits to Europe in 1992 and 2002, I was alarmed to see the relative decline of the United States in wealth, reputation and hard science. In my visit to China this summer, I was promised full support in the costly cyclic tests if I can run my research in China every summer."

And . . .

"I don't think he adds much more to what I have already told you about my own area of research. For me, I replace China by Belgium, Germany, and France."

These two quotes are by colleagues of mine who are expressing serious discouragement at the sight of the decline of American scientific and engineering research. This correlates with two recent reports on engineering research, released by the preeminent organizations that study and fund such activity.

The National Academy of Engineering report, "Assessing the Capacity of the U.S. Engineering Research Enterprise" — <http://www.nae.edu/NAE/engecocom.nsf/weblinks/MKEZ-68HQMA?OpenDocument> — was an evaluation of the past and potential impact of the U.S. engineering research enterprise on the nation's economy, quality of life, security and global leadership, and of whether public and private investment is adequate to sustain U.S. preeminence in basic engineering research. A 15-member NAE committee conducted fact-finding activities and prepared a brief draft report with findings and recommendations. Their basic finding is — no surprise — funding for engineering research is dismal, especially compared with medical funding. The basic recommendation is — a lot more funding. They give specific ideas for radical changes in how research institutions could operate, on a scale analogous to the founding of the land grant universities and the GI bill in terms of transforming the academic landscape. A recent National Science Foundation report "Making a Case for Engineering" — <http://www.nsf.gov/attachments/104206/public/FinalCase.doc> — also makes much the same case, that engineering research, which is the foundation upon which the nation's wealth is built, is woefully underfunded. This is at the same time that other nations, including some potential adversaries, are spending tremendous amounts to build up their economies and their military.

Adding insult to injury, the same NAE report also states that more and more research work at corporations will be sent to fast-growing economies with strong education systems such as China and India. In a survey of more than 200 multinational corporations on their research center decisions, 38 percent said they planned to "change substantially" the worldwide distribution of their research and development work over the next three years — with the booming markets of China and India, and their world-class scientists, attracting the greatest increase in projects. Blue-collar outsourcing has led to white-collar and now research outsourcing.

One of the greatest obstacles is the "disconnect" between engineering innovations and the people who use, rely on and prosper because of them. Surveys demonstrate that the general public is not well aware of the nature of the engineering profession and its impact on quality of life, even though engineering has compelling success stories to tell. We need to remember that engineering research is every bit as creative and challenging, requiring talent as much as any art or science.

It seems that these trends, if they continue, will pose a strategic threat to the United States. Our leaders need to put this problem on the front burner for deliberations and solution.

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