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Cover: Novel polymers are being harnessed to create new variable-rate drug implants — many of which automatically match their drug-dispensing rate to the body's need for that drug. The biodegradable polyanhydride spheres shown in this scanning electron micrograph (magnified $\times 1,660$) are small enough to be injected into the body with a hypodermic needle. (Photo: Edith Mathiowitz/MIT)



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Letters

Integrating industry and academia

Some of us in academia have been aware for years that in general the faculty members who work with industry are more active, publish more papers, have more graduate students and are more productive than the faculty that avoid industrial contacts ("Professors minding their own business," SN: 6/14/86, p. 371). There is always some concern about freedom to publish and choice of projects. I have found that faculty members are able to deal with the problems. In most cases, industry people are far more cooperative and understanding than university administrators.

On the question of university/industry relations, I claim that academics do not exist independently of the society in which they live. If the society fails, the universities go with it and vice versa. The fact that the University of Michigan had to lay off tenured faculty a few years ago is an example of this effect.

All of the above is especially true of engineering schools; engineering is by definition "applied science." Engineering faculty who consider themselves "above" working with industry have lost the understanding of what engineering is all about. If I were dean of an engi-

neering school I would "require" that every faculty member have an active program of consulting and summer work with industry. Any faculty member that could not find an industry or company to work with would be asked, "What are you doing in engineering?"

Stuart A. Hoening
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and Computer Engineering
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Wailing and teeth-gnashing

I read with interest "The Troubled State of Calculus" (SN: 4/5/86, p. 220) and the related letters in the June 7 issue. I find that I must agree with Prof. Menke: There is not enough outside application of calculus (or other undergraduate math courses). Students take calculus and then wait (sometimes forever) before seeing a course that uses this material.

Prof. Nicklin likes the old books with applications and so do I. My favorite calculus book is Courant's *Differential and Integral Calculus*. Unfortunately, I find that my students do not share my enthusiasm for application to physics, engineering, biology, etc. The students ask if they have to know the applications, and if I say yes, there is much wailing

and gnashing of teeth.

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Really great teachers are indeed few and far between. But I think that in this day of video cassettes, the most gifted should be encouraged to present their material on tapes that can be widely distributed to both schools and individuals as well.

In Xi'an, China, I recently spent an evening in the hotel watching the two local TV stations. On one channel was a teacher explaining on his blackboard what I took to be a lesson on differential equations. His thoughtful, albeit sometimes laughter-provoking, methods seemed to be very effective. The next evening he was on again. To me this was a high tribute to the quality of Chinese programming.

A broad exposure for the most gifted teachers of a variety of subjects could be informative and entertaining. I think in time it would be widely accepted.

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