

cannot be overstated. Perhaps the most celebrated case is that of the World War II German rocket developers, who incorporated the drama of the countdown into a rocketry demonstration. The nontechnical "boss" was so impressed that he funded the project. But for a single demonstration, we might never have landed on the Moon! Actually you don't even need a working demonstration. *Star Wars*—the film that launched a thousand (test) missiles—generated untold billions in research funding. Multimedia technology and virtual reality simulations are now within reach of even the leanest budget. No physicist can afford to ignore these rapidly emerging capabilities.

Proposals must state your case in simple but moving language that is intelligible by nontechnical people. Research sponsors are flooded with hundreds of brilliant proposals. Find out what the sponsor wants ("Know thy sponsor") and how you can deliver it ("Ask not what your research sponsor can do for you, but what you can do for your research sponsor"). Good communication and writing skills are essential. Your future could well be decided by the phrasing of a single "bullet." Even if you hated language arts, you should take a couple of writing courses. You should visit all potential sponsors before submitting proposals. A smooth personality and good "people skills" are not only a plus but an absolute necessity. A few drama and psychology courses might help. Introverted geniuses had better hire a good agent.

In this global economy physicists must be prepared to seek funding opportunities wherever they occur. Thus physics students should study foreign languages of emerging research sponsors, such as Arabic, Farsi and Korean, and should do their utmost to find out about other likely sponsors.

Money doesn't grow on bushes (and even where it does, you still have to know how to process the leaves). Too many physicists lack even basic technical abilities. Experimentalists should acquire such skills as plumbing and welding so that they are not dependent on costly outside technical support (and so they will be employable even outside of physics). Practical computer skills (such as the ability to turn out a color transparency on short notice) will make you an asset to any employer. Speaking of money, if you do get funded, you will have to manage and account for it. Every physicist should take a course in accounting. Actually, it would not hurt to take a few

business courses. You might even want to do an MBA, which could put you on a management track: When cutbacks occur, somebody has to manage them; also, you would have the skills to start your own business. In addition it would be useful to take a course in patent law in case you make any useful discoveries.

The graduate admissions process must be completely overhauled. Prospective graduate students should be required to submit proposals detailing their study and research plans, including "milestones" and budget estimates with full accounting of such factors as administrative overheads and salaries. Those who survive this first cut would then be invited to give an oral presentation. To ensure that only those who can function in the real world are admitted, the admissions committee would consist of the football team. Of course those with their own funding could bypass this process.

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## Why 'Rule of Thumb' Is a Sore Point

From the number of times I've encountered physicists using the term "rule of thumb" lately, the most recent being Lawrence E. Tannas Jr (December 1992, page 55), it is obvious that many physicists do not know how offensive this term is. The historical origins of the rule of thumb lie in the old English common-law doctrine that "a husband had the right to whip his wife, provided that he used a switch no larger [thicker] than his thumb."<sup>1</sup> There is no specific year or decade to which one can point in which the husband lost his authority to beat his wife,<sup>2</sup> but the rule of thumb was affirmed in Mississippi in 1824 and denied in North Carolina in 1874. The English law was derived from the One Hundred and Seventeenth New Constitution of Roman Emperor Justinian I, published in 529 CE. Roman law gave a husband freedom to beat his wife for committing treason or adultery, plotting against his life, attending banquets or bathing with strangers against his wishes, or attending circuses, theaters or other public exhibitions without his knowledge or against his wishes.<sup>3</sup> This law also prohibited a woman from divorcing her abuser if he beat her for other reasons, although unlike early English law, Roman law made the husband pay her restitution in that case.

Why should anyone care about us-

ing such language now? Half of all women in the United States will be battered by an intimate partner at some time in their lives.<sup>4</sup> The violence in 1 in 12 such assaults is so severe<sup>5</sup> that battering is the single most important context for serious injury to women in the US.<sup>6</sup> At least one-third of all visits by women to emergency medical services are caused by battering.<sup>7</sup> According to the FBI, over the last seven years 29.4% of all women murdered were killed by their husband or partner.<sup>8</sup>

Why should physicists in particular care? One reason for the low percentage of women in physics is overt sexual harassment by men, but another is the chilly climate fostered by men's ignorant use of insensitive remarks. We each have a responsibility to educate ourselves and replace terms that restimulate terror, like "rule of thumb," with emotionally neutral or positive terms, like "commonsense rule" or "benchmark rule."

## References

1. From *State v. Oliver*, 70 North Carolina Reports, at 60 (p. 44), 1874, the North Carolina case that disallowed the practice. See also D. Martin, *Battered Wives*, Pocket Books, New York (1983).
2. R. Calvert, in *Violence in the Family*, S. K. Steinmetz, M. A. Straus, eds., Dodd, Mead, New York (1975), p. 89.
3. Title 18, One Hundred and Seventeenth New Constitution, translated and edited by S. P. Scott, in *The Civil Law*, vol. 17, Central Trust Co., Cincinnati (1932), p. 59.
4. L. Walker, *Terrifying Love: Why Battered Women Kill and How Society Responds*, Harper and Row, New York (1989), p. 106.
5. M. A. Straus, R. J. Genes, S. Steinmetz, *Behind Closed Doors: Violence in the American Family*, Doubleday, New York (1980).
6. E. Stark, A. Flitcraft, *Sociol. Rev. Monograph* 31, 147 (1985).
7. V. McLeer, R. Anwar, *Ann. Emergency Med.* 16, 1155 (1987).
8. US Dept. of Justice, *Crime in the United States: Uniform Crime Reports* (1985-91).

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## One Scientist Who Made His Stamp

Re: Recent letter suggesting stamps honoring scientists (November 1992, page 120). See stamp. [*Editor's note*: This letter arrived on a postcard bearing a 29¢ US stamp depicting "Theodore von Kármán: Aerospace Scientist."]

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