

Introduction: What Keeps Us Going?

Physicists, and Other People

By now I have learned not to admit that I am a physicist. When a new acquaintance, sooner or later, asked me what I do, I used to answer. “I am a physicist.” Then I would watch the eyes glaze over as my questioner looked for some graceful way to escape. So, after a long while, I decided not to admit being a physicist. Instead I would say that I am a materials scientist. This answer, somehow, proved to be either less frightening or more intriguing. Typically it would elicit a follow-up question of some sort. To “What does a materials scientist do?” I might reply that I was the director of a large research institute at the University of Connecticut, which studied the properties of all kinds of materials, and then I would quickly change the subject.

If asked what materials science *is*, I might explain that it is the study of the physical properties and underlying structure of the materials from which everything in the world is made, including people. At that point, usually, the questioner would change the subject.

If the new acquaintance pressed for more details, I would explain that my personal interest lay in discovering the physics of individual atoms and how they determined the properties that materials may exhibit. In return, I would be informed that my new friend admired physics or, perhaps, stood in awe of physicists. For a variety of reasons, however, he or she had not pursued the subject. If questioned still further, I sometimes admitted having authored several physics texts. This admission was

frequently followed by a wistful exclamation: If only I would write a book that they could understand!

What every physicist secretly dreads occurred to me a couple of summers ago. I was awaiting having my throat cut (well, neck, actually) at the Yale-New Haven Hospital. The surgeon, who was about to perform the carotid endarterectomy, asked me in the preoperation waiting room what I did. Upon learning that I was a physicist, he gazed down on me sympathetically and admitted that he had great difficulty getting into medical school because he nearly flunked his physics course in college. Now you understand why it is not a good idea to admit to strangers that one is a physicist!

Women tended to be my most sympathetic questioners. This was particularly true if they were single and discovered that I was also unmarried. While on a cruise in the Caribbean, I met a woman who was so sympathetic that I proposed marriage to her even before the cruise had finished.

Beth was an accomplished psychologist specializing in the behavior management of school children. A professor of physics was hardly a challenge to a successful tamer of bratty kids. Yet she never let me know this and always evinced the greatest respect for one who was learned in a subject that she had somehow neglected studying during her extended educational career.

Beth had completed her doctoral program at the University of Minnesota. Although she had managed to spend nine years in college without studying physics, her training in science included a philosophy of science course in which she discovered that the laws governing nature were parsimonious: the simplest possible explanation is usually the correct one for any natural phenomenon. Even without direct exposure to it, Beth realized that physics, being the most basic science, must provide parsimonious explanations. So she now harbored some regrets about not knowing any physics. Very curious by nature, she welcomed information about how an electric fuse worked, or how a rocket could fly, or why the sky was blue all day but turned red after sunset. She would be glad to linger at the breakfast table in order to unravel some such mysteries.

Whereas Beth, as a young woman, had been discouraged from pursuing subjects like physics, my own early educational experiences had been much more positive. Finding all school subjects, and especially mathematics, very easy, I relished the attention and encouragement lavished on me by my teachers. This pleasure was lessened only slightly by occasionally having to defend my right to being a teacher's pet with my far less talented fists. Referred to repeatedly as 'that little Einstein', I grew up with a burning desire to become like Einstein — a physicist. Of course, I had no idea what being a physicist meant other than it gave me a distinction among peers who aspired to become accountants, or doctors, or lawyers, or, occasionally, baseball players. By the time I went to college and majored in physics, I realized that the science of physics actually was neither more or less interesting or challenging than any of the other subjects pursued by my fellow students, but it held many fascinations for me. It wasn't until I had slogged through all required courses in graduate school that I fully appreciated why being a physicist was not synonymous with being an Einstein. But, by then the die had been cast.

Why does physics inspire such dread? The truth is that physics is no more difficult than any other college subject. What probably makes it *appear* to be difficult is the mystique that nonphysicists attribute to it and that physicists love to perpetuate. I also discovered, after becoming a physics teacher myself, how much easier it is to dwell on the intricacies of the mathematical language that physicists use than it is to explain the underlying meanings of all those equations to students. Unfortunately, it is often poorly prepared teachers who make any subject seem to be difficult or uninteresting.

My own *bete noir* in college was a brief and most unsatisfactory exposure to poetry. I have not really liked poetry ever since. Yet I have also heard skilled expositors who could make even poetry sound appealing!

So it was that some time after I married Beth, I decided to try my hand at writing a book that would make physics easier and more interesting for

general college students. As I became increasingly absorbed in this effort, it spilled over into our breakfast conversations. In this way I became the physics Sheherazade of a thousand and one breakfasts.

What follows are my recollections of some of the more memorable of these breakfast discussions...