京大過去問　２０１１年　第２問

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The life of a physicist can be a lonely one. Imagine this: You sit down in an airplane, and the person next to you asks you what you do for a living. You reply that you're a physicist. From here, the conversation can go one of two ways. Nine times out of ten, the first thing out of his or her mouth is something along these lines: "Physics? I hated that class!"

(1)You'll then spend the rest of the trip (or party, or elevator ride, or date) apologizing for the emotional trauma that physics has apparently inflicted on your friend. These random encounters often reveal an almost joyful contempt, reserved specifically for the fields of physical science and mathematics. "Oh, I'm terrible at algebra!" for example, is said in an almost boastful tone, in a way that "I barely even know how to read!" never would. But why?

Physics has a somewhat unfair reputation for being hard, impractical, and boring. Hard? Perhaps. Impractical? Definitely not. Indeed, when people try to "sell" physics to the public, it is almost always in terms of how it can be used to build bridges or launch rockets — that is, how physics is ultimately the foundation for engineering or chemistry.

But boring? That's where we really take issue. (2)The problem, as we see it, is that the practical side of physics is almost always put forward at the expense of the interesting side. Even folks with technical focuses such as engineering and computer science typically don't get past mechanics and electromagnetism to the really fun stuff. And that's a shame, because quite frankly there has been very little cutting-edge research done on pulleys in the past few years.

This hostility to physics seems to be deep-rooted, and makes it difficult to have discussions without discouraging an audience. In starting a scientific conversation with a "civilian," we promoters of physics often feel like we're trying to force people to eat their vegetables, and rationalize it in the same way. We never begin physics discussions with "It's fun!" but almost always with "It's necessary," which naturally drains all of the fun out of it.

In an era when new technologies are constantly emerging, scientific literacy should be fundamental. On the other hand, it isn't necessary that you have four extra years of college sciences to understand them. You don't need to have a detailed knowledge of exactly how the physics works to appreciate the revolutions in quantum computing or cosmology. It is important, rather, to understand why these developments are significant, and how they will change technology and our lives.

And it's not simply that people need to understand a particular theory. Physics is the model inductive science, and by understanding how science proceeds, people are better able to make informed decisions about issues such as global warming. The hope is that we are more prepared to refute people who disagree with us by offering facts rather than simply insisting "No."

(3)The United States, in particular, has an immense problem with science and mathematics education, with high school students performing well below average compared to those in other developed countries. But we cannot limit ourselves to only blaming teenagers, or their teachers. The problem is far-reaching, affecting all walks of life.

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