

Dances with physicists

Assuming that the questions posed by Steve Benka in "The Entangled Dance of Physics" (PHYSICS TODAY, December 2006, page 51) are not meant to be merely rhetorical, I would like to answer some of them. The questions suggest that the answers might reveal a homogeneous group of nonacademic physicists. My answers, however, constitute a sample of one and should be interpreted as such.

I finished my PhD in physics at the University of Illinois at Urbana-Champaign in 1984. After a couple of postdoctoral assignments, in 1988 I started working in the engineering group of Beckman Instruments Inc in Palo Alto, California. Officially, my title is now something like "senior staff advanced research scientist," but I refer to myself as "senior staff physicist" on all correspondence and on my business card. So, in answer to the question "Do physicists [outside academia] have an inferiority complex or the opposite?" I would say I am very proud to be a physicist and consider that a core part of my identity, both personal and professional. To the question "Have they become apathetic to or ashamed of their origins?" my answer is emphatically no. I cannot conceive of any physicist becoming apathetic about such a grand science and profession. I always get a sense of thrill when my new issue of PHYSICS TODAY arrives in the mail.

"Have [nonacademic physicists] moved on to heights of discovery in new realms that academics can only dream of?" Hardly! Instead, I have been very busy importing into my organization some well-established engineering tools and technologies that have been developed over decades by the engineering community, especially its aero-

space engineering segment. It's a blast! Such powerful tools as you can hardly imagine. But whereas an engineer might see the tools only in terms of their utility, as a physicist I see them as marvelous and complex creations that stem from the entanglements described in the article.

Benka comments that "many who live there [in nonacademia] ply their trade invisibly; we don't know how to see them." I agree, but it's not clear to me to what extent—if at all—the physics community suffers on account of that invisibility. I *can* say that physics graduate students who approach graduation with the idea that anything else but an academic career is tantamount to failure are badly misinformed. The invisibility of nonacademic physicists can and should be reduced by physics departments inviting us to departmental colloquia for a description of our work. Graduate students should get entangled with nonacademic physicists as early as possible.

Benka's article resonated with me. It captures everything I love about physics, the physics community, and what Victor Weisskopf called "the privilege of being a physicist."

Jeffrey Marque

(jjmarque@sbcglobal.net)
San Mateo, California

Steve Benka writes that he attended a conference organized by a software developer and that he met two physicists there. One of them did physical research in the field of polymer diapers; the other directed the development of instruments for measuring the dielectric properties of road asphalt. Both saw themselves as engineers, Benka adds, and says he thinks that is a curious self-interpretation.

I think those two physicists are right in calling themselves engineers. I think the entanglement of science and technology compels us to reformulate the problem of physics's invisibility.

Benka has to be admired for his forceful analysis of the basic properties and toolkit of a physicist. But he has disregarded one point: the kinds of things investigated by 21st-century physicists. Normal nonacademic physics does not

"pursue answers to eternal questions," Benka says. It has become entangled in the modern-day web of technology, industry, and government programs. Consequently, normal physicists apply their toolkit to the investigation of diaper polymers, road asphalt, hearing aids, semiconductors, optical fibers, and so on. These materials and devices cannot be found in nature. They are the products of human industry.

Both polymer diapers and diaper polymers have been synthesized or manufactured. When the North American continent was first explored, the Allegheny Mountains were there, but neither asphalt roads nor road asphalt could be found. Some materials may be naturally semiconducting, but the normal semiconductors of institutional physics are technological products consisting of synthetic materials.

What of the visibility of normal physics, the scientific discipline that researches into the objects and materials of the everyday world? Its visibility is severely restricted because of its entanglement in the structures of technology, industry, and politics. The restrictions stem from the obligation to remain silent in the interests of political expediency and industrial competition. Secrecy and invisibility are highly valued in those spheres.

The question of physics's visibility becomes the question of its independence. Physics resembles journalism on that point. And Steve Benka knows a great deal about journalism. Science and journalism bear a close family resemblance. Both physicists and journalists are curious about the world. They need to understand its workings, and they try to do so without recourse to authorities. They both also subscribe to the ideal of objectivity. But in both cases it is also true that their independence may be restricted by the power of owners, investors, advertisers, and the like, which can result in intentional invisibility.

Joost Mertens

(joost.mertens@laposte.net)
The Hague, Netherlands

Rarely have I been so moved to think about and examine my own curious career path as I was after reading

Letters and opinions are encouraged and should be sent to Letters, PHYSICS TODAY, American Center for Physics, One Physics Ellipse, College Park, MD 20740-3842 or by e-mail to ptletters@aip.org (using your surname as "Subject"). Please include your affiliation, mailing address, and daytime phone number. We reserve the right to edit submissions.