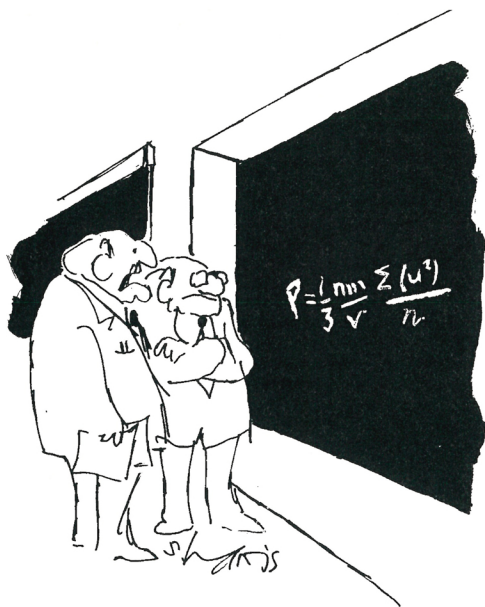




"WHAT'S MOST DEPRESSING IS THE REALIZATION THAT EVERYTHING WE BELIEVE WILL BE DISPROVED IN A FEW YEARS."

use of the Einstein-Podolsky-Rosen effect to study *CP* violation in flavor-mixed mesons. The discovery of new heavy flavors of quarks and leptons. All these developments were exciting. There were puzzles remaining to be resolved and understood.

Let us not be misled. The world is very likely to change as much during the next 50 years as it changed during the past 50. We want our students to be excited by the possibilities of unpredictable future discoveries. This has nothing to do with any of the material that has been circulated and published by the so-called social constructivists and their opponents. Whether they are right or wrong is irrelevant. They are simply boring. I cannot see how any bright student would be turned on by them.

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Arnold Siegert Remembered

Max Dresden's obituary of Arnold Siegert in your March issue (page 98) revived some highly personal memories. Siegert was the finest teacher I had at any educational level. During the turbulent 1960s, I was fortunate enough to take his year-long graduate course in statistical me-

chanics at Northwestern University. In the ways he linked condensed matter physics and chemical physics, and the precise, coherent manner in which he formulated each topic, one could observe the work of an artist portraying the harmony inherent in macroscopic systems. Among my life experiences, I rank high taking those classes and performing well in Siegert's difficult examinations.

My last encounter with Siegert occurred in 1979, the year he retired. When I commented on the bleak situation for scientists in American industry, he replied that when industry had financial difficulties, research staff often suffered brutal consequences. His words of wisdom came back to me when I read

in that same March issue (page 73) Silvan Schweber's essay on the continued downsizing and marginalization of fundamental research in the American industrial environment. I do feel that Siegert would applaud the development of the Forum on Industrial Physics within the American Physical Society as an antidote to the continuation of the destructive attitude.

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Math Is Indeed a Key Part of Introductory Physics Textbook

As two of the *Workshop Physics* instructors at Dickinson College, we would like to take issue with a statement made by Robert Jones in a letter published in your April issue (page 15). He states that "Priscilla Laws's *Workshop Physics* seems to be an attempt to make physics more experimental and less mathematical. Are we simply running away from math because students don't like it?" We feel frustrated by his misconception that *Workshop Physics* is less mathematical than most introductory courses.

In *Workshop Physics*, lectures and traditional laboratory experiments have been replaced by a mix of observations, guided derivations and experi-

ments. As part of the guided derivations included in the *Workshop Physics Activity Guide* (Wiley, 1997) for example, students take derivatives; do basic integrations to find work and electric potential; find vector and scalar products; solve the differential equation for harmonic motion; do the kinetic theory derivation relating temperature of an ideal gas to the mean kinetic energy of its particles; and develop the differential equation that describes the motion of a chaotic physical pendulum.

Our examinations are twice as long as those in traditional courses, and we have deliberately included at least one hour's worth of mathematically rich problems on each examination. These conventional problems are based on those we used to give before developing the workshop approach. Every *Workshop Physics* examination also includes conceptual and data analysis questions. We see no loss in the conventional mathematical abilities of our students. However, through our mathematical modeling exercises, our students are acquiring additional mathematical skills not fostered in our previous courses.

Ron Thornton from the Tufts University Center for Science and Mathematics Teaching has completed a preliminary assessment of the ability of the Dickinson College *Workshop Physics* students who have just finished the mechanics portion of the course. After examining how they relate physical behavior to the structure of equations, he concluded that our students do significantly better than students in a traditional calculus-based physics course.

We urge Jones to take the time to study the textbook he criticizes.

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Corrections

August, page 51—In the photo, Michel Vitasse is third (not fourth) from right.

August, page 71—VG Microtech's place of business should have been given as Bellbrook Business Park.

August, page 85—S. Fred Singer's e-mail address should have been given as ssinger1@gmu.edu. ■