



Complete Nuclear Physics Teaching Laboratory

At last! An accelerator-based teaching system for less than \$50,000. A lot less if you already have some of the electronics.

By system, we mean first, the equipment: a 400 KeV Van de Graaff accelerator, vacuum equipment, magnet, scattering chamber, detectors, radioactive sources, support electronics, pulse height analyzer, and radiation monitor.

Second, our teaching manual: 30 graded experiments in nuclear physics, explained step by step, enough to fill a 3-semester laboratory course. By then the student will have performed the fundamental experiments of nuclear physics and encountered a great deal of quantum mechanics, atomic physics, and solid state physics.

Research? Yes. In nuclear physics, solid state physics, atomic physics, and activation analysis. The magnet provides for additional research stations where your staff and graduate students can do original work.

It's everything a teaching/research system should be: simple to operate, virtually maintenance-free, easily modified for different experiments, low initial cost, expandable with optional equipment.



Our booklet, "The Van de Graaff Nuclear Physics Teaching Laboratory," shows just how this equipment and course book combine theory and practice in the modern physics curriculum. We'll be glad to send it to you.

HV HIGH VOLTAGE ENGINEERING
Burlington, Massachusetts

Name _____

Position _____

Organization _____

Address _____

Zip _____

choice of subject matter and the method of presentation. (c) These students are usually not strongly prepared mathematically so that "solving one differential equation in all its detail" could not be done by the student without superhuman effort on the part of both student and instructor; even then, if it were possible, strong emphasis would need to be placed on giving physical significance to the mathematical symbols; we must talk a language a student comprehends.

If we were to return to the idea of no special courses for nonscience majors such as was prevalent when I was an undergraduate, and even if the physics departments' standard offerings were changed to include all the good ideas set forth in recent articles both in *PHYSICS TODAY* and *The Physics Teacher* (an impossible feat to be sure) I fear there would not be many future historians, housewives and philosophers enrolled in these courses. However, I do agree their presence would possibly benefit future scientists.

(MRS.) KATHERINE J. SOPKA
University of Colorado

About those nonscientists

Your March editorial stirred considerable comment in the Swarthmore physics department. I would like to collect some of the reactions and thoughts.

We found that we disagree (in a good-natured way) with several aspects, both of your interpretations of the phrase "physics for nonscientists," and of your analysis of the purpose and content of introductory courses. For example, the question whether psychologists can prove that some persons are cut out to be physicists and some are not appears irrelevant; we who teach see the data all the time. Also, it is not necessary to run everyone through an entire career to separate the categories. The first few hour exams serve rather well. Your remarks on the extent to which past experience (or the lack of it) can be useful in making the separation between scientists and nonscientists are probably right although your criticism appears to apply equally well to the way in which most irreversible choices are made (for example, admitting people to a college or a graduate school).

In fact, students who are strongly attracted to science do not need to be

forcibly separated from others. They are usually distinct already in their approach to their studies and particularly in the sophistication of their interest in the natural world. Asking whether the future scientists and nonscientists lose by an academic separation that ratifies this distinction appears less to the point than asking whether they would lose more by being together and either boring or depressing each other. The subject matter of a course should be presented in a form that is relevant to the student, builds on his past experience and helps where he is weak. The (self-chosen) future physicists *want* equations and also are very often more adept in a laboratory than other students. A special course is not only academically good for these people, it can also strongly reinforce their eagerness to learn. Persons who are not strongly attracted to one of the natural sciences tend to be more interested in words than in numbers or equations and often appear to be completely out of their element in dealing with real, concrete physical objects. The contributions that these people might make in a science course are, unfortunately, seldom expressed. If a future physicist wants to learn the point of view of a historian or literary critic, he usually has to (and should!) go to other departments.

The increasing remoteness of physics from everyday life should not be confused with the remoteness of a physicist's life from the way in which most people live and work. We feel that the way to reverse the former situation is to give nonscientists a good taste of physics. To do this it is not necessary to frustrate the future physicists by slowing them down. Thus we agree with your comment that a course for nonscientists should treat some physical problems in complete detail rather than give an "overview." However, we would probably like to see more emphasis on a thorough understanding of phenomena in the laboratory than on details of a differential equation.

C. D. CANTRELL
Swarthmore College

What is a scientist?

I am writing in reference to the February editorial titled "Can Anybody Hear Us?" The editor, R. Hobart Ellis Jr, is quite justifiably concerned about the problem of conversation between scientists and humanists about