

LETTERS

Ge(Li) beans

SOMETHING TO CHEW ON.

Open APS Council meetings

I find one very significant point overlooked in your otherwise fine report on the very stimulating business meeting of the American Physical Society in Chicago. As you pointed out, it seemed that the members were less interested in supporting the Schwartz amendment than in expressing their dissatisfaction with the way the APS operates; also that this dissatisfaction appeared to focus on the idea that "the society was not democratic." The point that you overlooked was Leonard Schiff's reply to this accusation and the implications of that reply. Schiff stated that the society was *not* democratic but representative. On the surface this appears reasonable; the council is in fact elected by the membership by secret ballot. However, representation implies more than election; it implies a feedback to the electorate. This is the implication of the "freedom of the press" clause of the first amendment; it is the press that by and large tells us what our representatives in Congress do. But Congress goes even further; not only are its deliberations open to the public and press (except where national security is involved), but it also publishes a record of these deliberations for general perusal. The APS Council holds closed meetings, and its minutes are not made public. This is hardly a representative system.

I admit that it may not be practical for the council to hold open meetings, but surely one per year in the form of the business meeting at Chicago, with the council and officers up front, open for questions, would not be too much. Also, I am sure that the minutes of the council meetings would be pretty dull reading, but they still could be published in the APS Bulletin so that the membership can see what goes on if it wants to. (This does not preclude executive sessions of which minutes would not be made public; however, the subject areas should be identified.) Perhaps there are some members of the council who would be unwilling to serve if they had to justify their votes to the membership, but then, perhaps, those individuals should not serve. It is just this moral

pressure from the membership to the council, made possible by full disclosure that could make the society more responsive to its membership.

ARTHUR HERSCHMAN
American Institute of Physics

A real enough cleavage

After reading your thought-provoking editorial entitled "Educating Nonscientists" in the March PHYSICS TODAY I would like to offer a few comments based on my experience in the past ten years as a teacher of physics to "nonscientists."

First: I would suggest that the term "nonscience majors" instead of "nonscientists" be used in the discussion of different course offerings at the posthigh-school level. Your editorial does not state explicitly that this is your concern, but it is at this level that most diversity occurs.

Second: Although such courses and the standard courses given by physics departments are frequently labeled "introductory," they are very rarely the first science course the students take as assumed in your first paragraph. By the time a student is 18 years old, he has had, in most cases, sufficient exposure to science to have decided whether he wishes to pursue a scientific career.

Third: Although the distinction between scientists and nonscientists in our adult population may require the drawing of an artificial line, there does seem to exist a real enough cleavage to draw the concern of such authors as C. P. Snow, especially when this cleavage involves a feeling of alienation. Hence the students we are discussing are the nonscientists of the future.

Fourth: An integrated-studies physical-science course, such as those I am familiar with, is based on the recognition of certain realities, such as the following: (a) Many of the students have begun to be alienated from or by science courses; hence a conscious effect must be made by the instructor to generate confidence, interest and enthusiasm. (b) In all likelihood such a course will be a terminal science course for these students, and this fact influences the

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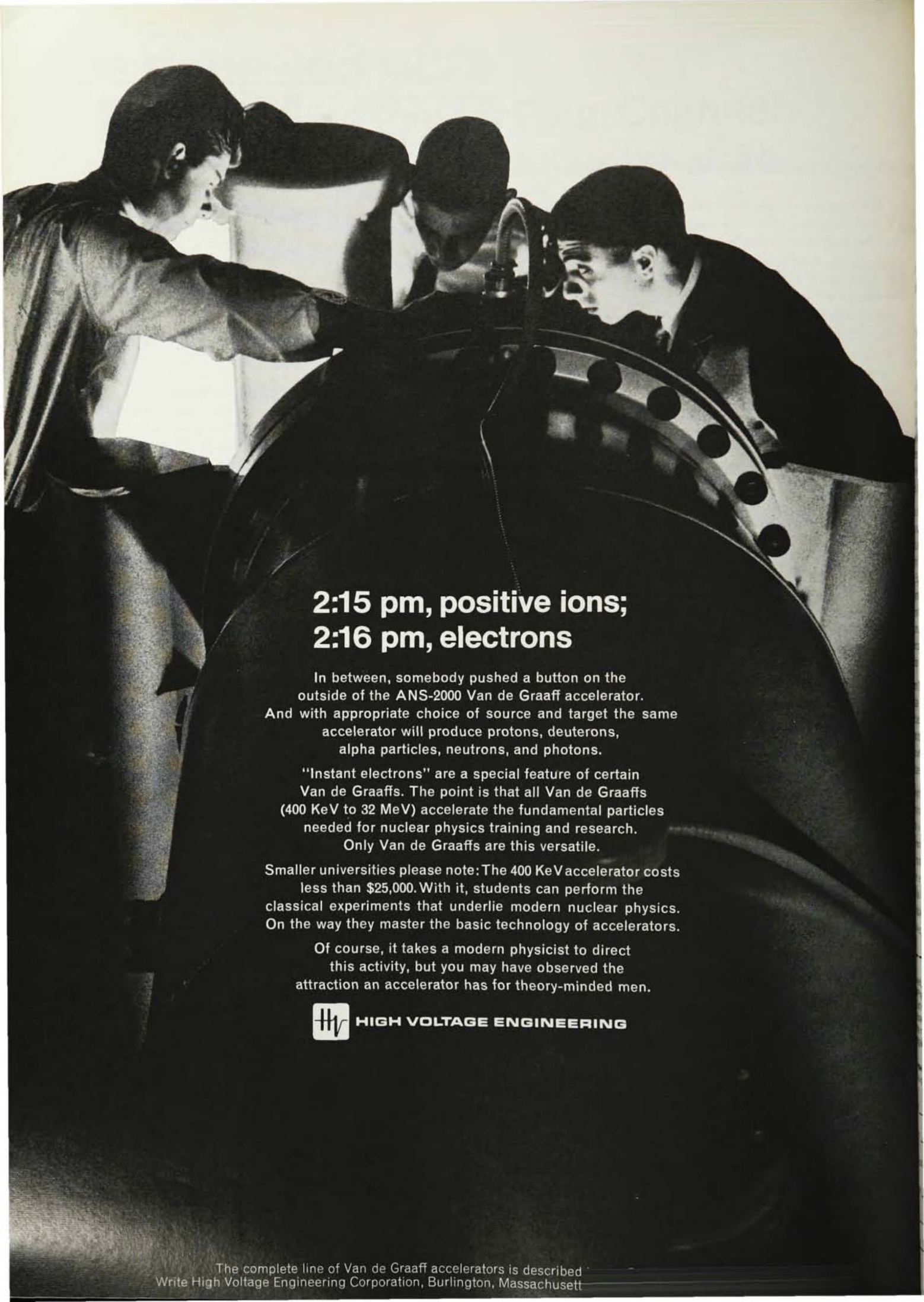
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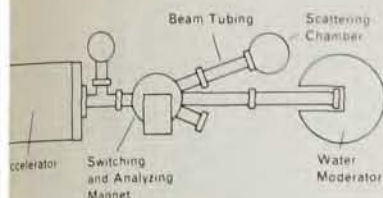
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choice of subject matter and the method of presentation. (c) These students are usually not strongly prepared mathematically so that "solving one differential equation in all its detail" could not be done by the student without superhuman effort on 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