direction. Increasingly, American physics texts are adopting SI units. As more students, trained in their use, move on to use them in the journal articles they write, their prevalence will expand. Future editors of the *Vade Mecum* will undoubtedly take note.

HERBERT L. ANDERSON
Editor-in-Chief
2/83 *AIP Physics Vade Mecum*

PhD for teaching

As a positive response to Paul Smith's letter (January, page 116) I would like to make a radical proposal for preparing prospective undergraduate physics teachers. I challenge graduate physics departments to initiate a teaching-track program leading to the PhD in Teaching (PhD-T) with a status equal to that of the standard research-track degree (which would be renamed the PhD in Research).

Students in the PhD-T program would have basically the same course requirements as their research-track peers and would be required to take a candidacy examination that emphasized physics through the first half of the PhD program of courses. As an option, a student in the program could take a limited number of courses in education or the philosophy of science.

The heart of the teaching-track program would consist of substituting supervised teaching for the traditional dissertation research. Students would teach lecture sections in general physics and two of the following major courses: mechanics, electricity and magnetism or modern physics. In addition, they would teach a general laboratory course and at least one advanced laboratory. The best and most experienced teachers among the physics faculty would supervise the teaching and give support to the PhD-T candidates.

In place of the traditional dissertation defense, PhD-T candidates would take an examination on the historical development of physics.

A teaching-track program similar to the one outlined above would, in my opinion, prepare undergraduate physics teachers of whom the physics community would be proud.

BYRON C. HALL JR
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Teaching without a PhD

A recent letter from Byron Hall (February, page 110) dealt with his opinion of whether or not it is necessary to have a PhD to teach college physics. My own recent experience as a faculty member prompts me to support Hall's conclusions.

First, let me state that my MS is in radiation science and not "pure" physics. I completed all the coursework for my PhD but was unable to obtain sufficient funding to complete my thesis. At the behest of the chairman of the physics department at my undergraduate alma mater (a four-year private community college), I filled in as instructor of physics. This was two days prior to the start of the new academic year when the original person (who had a PhD) requested to be released from contract.

During the academic year, I taught a non-calculus general physics course, modern physics, quantum mechanics, the associated laboratory courses and a survey course. The survey course is a science-related topic specially designed for non-science majors; the one I taught was entitled "Radiation and Radioactivity in Our Environment." The enrollment for this course was 37 students for the regular semester's offering and 45 for a special three-week spring–summer intersession.

The college also maintains a subcritical nuclear assembly for student training. Thus it is mandatory to maintain a strict regulatory and dosimetry program. Part of the requirements for my MS included knowing the Federal and State Nuclear Regulatory Codes, so I became licensed with the NRC and was responsible for all nuclear safety. Furthermore, I spent the three weeks of the winter vacation disconnecting and cleaning the pump, filters, and plumbing of the reactor to remove the crud built up through prior neglect. I was not reimbursed for this time nor was a student allowed to assist me, since there was not enough work-study funding available.

I encouraged the students to work on extra-credit projects. The culmination of one such project was the interface of a TRS 80 microcomputer to a student-grade multichannel analyzer.

My reward at the end of the year was being replaced by a recent PhD graduate (in theoretical physics) with little or no undergraduate teaching or laboratory experience. I had had a year of undergraduate teaching, plus graduate teaching experience during my teaching assistantship.

Currently I am employed at a national laboratory, where I hope my work can be used as a thesis project for my PhD. Maybe then I can return to teaching.

I pose the following question: Did it make any sense to replace a "seasoned" teacher who had demonstrated skill and devotion with a novice just because of a piece of parchment?

MARWIN RAPKIN
3/83 *(Address withheld by request)*

More on ice age in physics

I want to comment on the letter by Thomas Phipps (February, page 15). I was brought up believing that physical science, because of its logical character, was self-correcting. What, then, is it about the present scientific climate that seems to perpetuate "bad" ideas and to prevent the appearance of "good" ones; why, then, has fundamental theory ceased to be self-correcting for most of the century?

A major question that needs consideration is how to tell "good" ideas from "bad." In retrospect, it is clear that Copernicus' Sun-centered planetary system was a good idea while the Ptolemaic Earth-centric system was a bad one, although each described the planetary motions quite well. There are many other notable examples throughout the past three hundred years leading to our present interpretation of nature. The history of the physical sciences shows clearly that the best ideas were those which simplified, unified and allowed the science to progress. One basic ingredient throughout the progress of physics since Newton has been a continuing development of physical intuition by succeeding generations of scientists. This was needed before a successful mathematical theory could be produced. Thus, to distinguish "good" from "bad" ideas requires a well-developed physical intuition on the part of physicists. Apparently, physical intuition has not been part of the development of physicists over the past fifty or so years, due primarily to relativity and quantum theory and the non-intuition-developing interpretation they inspire. In fact, it has become accepted dogma that the substance of twentieth-century physics is beyond human intuition and, consequently, we are toying with the idea that the physical world is not "real" after all. What we seem to have done is to back ourselves into a philosophical corner because of a succession of bad ideas.

As for the "Ice Age" concept itself, quite obviously there are not that many members of the physics community who accept that there is an "Ice Age"; otherwise, there would be no point to Phipps' letter. This would not be a problem to us who believe that physical theory is currently in a state of stasis if the journals, which are the usual sounding boards of scientific enterprise, accepted for publication alternative ideas to those presently in vogue. However, such is not the case. The APS journal editors, for example, and their coterie of referees appear to be acting as a bureaucratic filter system to eliminate all alternative ideas and theories, no matter how carefully the consequences of these proposals have