

CURRICULUM FOR THE TRAINING OF ASTRONOMERS: COMMENTS

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In this first international meeting on the teaching of astronomy, we should not only look at many specific techniques and approaches but also examine the overall process. In doing so, several general problems come to light and need to be commented upon:

1. Introductory astronomy course lab exercises are often lacking in rigor, compared to labs in other physical sciences. Students are often asked to do simple, qualitative exercises like drawing the moon or constellations – projects that bear more resemblance to 19th-century astronomy than to the work of modern science. Lab programs should be modernized, taking advantage of modern telescopes and ancillary instrumentation.
2. A survey taken of U.S. astronomy department chairs, in preparation for an American Astronomical Society roundtable discussion, revealed a wide spectrum of approaches to undergraduate astronomy instruction. The one single obvious result of the survey was the recognition of a need for an international survey, with the results distributed and discussed by the participants. The dispersion of programs may also suggest another need
3. The astronomy instructional community lacks a central journal for the publication of pedagogical articles. The physicists have the *American Journal of Physics* and the *Physics Teacher* for advanced and lower-level articles, respectively. While astronomical articles appear in these from time to time (as well as in other publications), there is no single publication that educators can depend upon to contain important articles. While there is probably too little material available to form a new journal or newsletter, perhaps educational sections could be started in the *Publications of the Astronomical Society of the Pacific*, *Mercury*, or *Sky & Telescope*¹.
4. Astronomy students (majors) are often told to “get a physics (undergraduate) degree” in preparation for becoming an astronomer, yet strongly desire to take *astronomy* courses. This dual-program requirement results in either larger course loads (to include the astronomy), or the possibility of losing them to other disciplines. Students can perhaps be kept interested by involving them in astronomy *research* while they are learning their basic math and physics.

These four points should be carefully examined by the international community

¹Ed. note: In late 1989, *Astronomy* has begun a teachers' insert.

of astronomy educators, and solutions devised at the appropriate levels to solve the problems that they address.

Discussion

J.-C. Pecker: *I am surprised that no one has so far mentioned the need for introducing in all curricula some coherent teaching about the history of ideas, of instruments, of astronomy in general. In my view, this is essential.*

M. Zeilik: *How does one rally the support for the practical, project, and experimental aspects of the University College London curriculum, which I admire?*

D. McNally: It is a matter of tradition. The degree, when first established by C.W. Allen, had a considerable commitment to practical work. The project came later, but at a time when funding could still be considered “liberal.” The amount of practical work per student has been reduced because of increase in student numbers without concomitant increase in provision of facilities — however, the demand on resources is still about the same as in the original scheme. I seriously doubt we could get such support if starting from scratch in today’s straitened times.

W. Bisard: *Is astronomy a required course of all elementary teachers in your teacher education colleges?*

D. McNally: No. Astronomy in the Education Colleges only exists where enthusiasts bring astronomy into their science curriculum — there is no formal requirement unfortunately.

J.V. Narlikar: Unfortunately, no, but we are trying to change that.

B.W. Jones: *The University College London astronomy degree is primarily aimed at producing professional astronomers, yet only ~ 15 per cent of the graduates enter astronomy in some form. Is this viewed with disquiet, or is it thought that “yuppies”² who know some astronomy will be better “yuppies” than those who don’t?*

Reply: The latter — where “yuppies” = all sorts of non-astronomical professionals.

W. Bisard: *The results of well-founded educational research firmly supports project-oriented or hands-on science and astronomy projects over lecture techniques. Unfortunately, university science educators do not realize this fundamental finding of science education research.*

²Ed. note: “Young urban professionals” led recently to the word “yuppie,” connoting shallow lives with much available money.