A Community in Crisis

As I write this, the revitalizing effect of a summer of travel and research is fading in the face of disquieting memos, messages, and news reports. Despite numerous retirements, our department has neither new faculty nor authorization to recruit. N sections of courses are being taught by engineering faculty, while even more are staffed by part-time adjuncts. The underfunding of state-supported higher education is now accompanied by proposals that would shift students from state universities to two-year colleges. Many deserving mathematicians were unable to obtain NSF grants, while those of us who did had budgets cut to the bone. And far too many good young mathematicians are unable to find secure employment in which their talents can flourish.

The mathematics community is in a state of crisis. The success of the heroic efforts to restore the Rochester Ph.D. program should not obscure the fact that many issues continue to threaten mathematics departments across the country. The underfunding of scientific research and of higher education also affects other groups. Rather than squabble over pieces of a shrinking pie, we must collaborate with other departments and disciplines to create a climate in which investments in research and in education are each valued enough to make the necessary funding a political necessity as well. Within the mathematics community we must recognize the need to support a variety of research and educational activities so that we can present a united front in Washington—not a false facade that masks dissension, but the result of healthy professional debate in which differences are sorted out to achieve a consensus position that benefits the entire community.

Although the problems are pervasive, some especially threaten the mathematics community. A shift in calculus enrollment from four-year to two-year institutions, or to technology-based "distance-learning", changes both the character and number of positions. The position of mathematics as the foundation of science and engineering has been turned on its head as administrators switch from viewing it as an essential discipline to a superfluous one which is implicit in others. How shall we respond? Not by acting as if mathematics Ph.D.s are the anointed ones in whom the ability to teach calculus is exclusively invested. How can we make such a claim when, for many years, some of the top mathematics research departments at institutions with prestigious undergraduate programs employed people with master's degrees to teach and/or coordinate calculus? Is viewing a lecture on a remote screen worse than doing so in a large room with 500 students? Nor can we fail to recognize that many faculty in engineering, physics, economics, and other disciplines are also doing good mathematics.

Why do universities have separate departments when there is so much overlap? Physics, chemistry, and mathematics were once grouped together under the rubric "natural philosophy". Now, some institutions even have departments for biophysics, statistics, operations research, etc. The departmental divisions necessitated by growth and specialization also create artificial boundaries. I would argue that educational quality demands that one group, the "mathematics faculty", be entrusted with the responsibility for mathematics instruction. It is far too important to be taught as a sideline by those committed to other disciplines. However, as articulated in Richard Maher's letter in the August 1997 *Notices*, we must take this responsibility seriously enough to replace the name-calling of the calculus reform debate by thoughtful curriculum development and evaluation.

One politician, instead of delineating the role of two-year colleges within a comprehensive educational system, argued for free tuition by asserting that community colleges primarily served poor and immigrant students. This attitude only extends the gap between elite high schools which offer calculus and those from which some graduates didn't learn to add fractions. There is more to a college education than an accumulation of course credits. Opportunities to interact with upper-division students, with research faculty, and with specialists in fields not represented at two-year colleges are valuable. Such benefits of a four-year educational experience should not be reserved for the affluent.

These are difficult problems. They will not be resolved by a "business as usual" or "we need better P.R." attitude. Only if we provide a quality mathematics education, whether to aspiring mathematicians or to students from other fields, can we hope to convince administrators, politicians, and tuition-paying parents that mathematics faculty are a necessity, not a luxury.

—Mary Beth Ruskai