ABOUT THE COVER

Often the group of transformations of an object, such as a honeycomb, or a herd of zebras, misses its essential symmetry. The article on page 744 explains how groupoids are used to capture that symmetry. Photograph by Art Wolfe for Tony Stone Images.

Whom Does the AMS Represent?

The primary purpose of the AMS is to further mathematical research and scholarship. Discussions of how this statement shall be interpreted have usually focused on the extent to which the AMS should be involved in mathematics education or where to draw the line on involvement in political and social issues which affect mathematics research. Little has been said about who constitutes the research community whose interests the AMS represents.

Roughly speaking, the AMS has 30,000 members, of whom 4,000 are foreign reciprocity members, 10,000 students, and 6,000 (including 1,500 emeritus) in special categories, leaving 10,000 "ordinary" dues-paying members. How are these 10,000 distributed? Less than half are at doctoral departments and less than one-third at group I and II departments. How well does the AMS represent the very large group of members trying to do research at nondoctoral departments?

The AMS seems to take a "what's good for General Motors is good for the country" attitude by representing the interests of a small group of top-ranked mathematics departments. This is not completely unreasonable. Just as the many jobs once provided by the U.S. auto industry may have done more for the less affluent than subsequent welfare programs, the entire mathematics community benefits from having strong centers of excellence. So I am not going to advocate weakening these institutions in order to spread the pot of research funding even more thinly. Indeed, with rare exceptions, graduate and postdoctoral research support should be concentrated at those institutions that offer developing mathematicians the opportunity to interact with, and learn from, the best in their field.

However, a strong research community has breadth and depth, as well as superstars. Moreover, because of the job market, many promising recent Ph.D.s who are now trying to develop research programs have positions at nondoctoral departments. The AMS must also represent the needs of the large group of researchers who are not at top, or even doctoral, institutions. Instead, the AMS established a Task Force charged with studying "resource needs for excellence in *undergraduate education* at *doctoral* institutions" (emphasis added), which later expanded its mission from "undergraduate education" to "scholarship" while continuing to restrict itself to doctoral institutions (see page 780). It would seem more in line with the AMS mission to have a task force on "resource needs for excellence in *research* at nondoctoral institutions", yet no AMS committee is explicitly charged with this responsibility.

Past efforts to do such things as implement a program of small grants ($5,000) have met vehement opposition. I do not wish to renew the debate for and against small grants. Rather, I wish to emphasize that such initiatives need not threaten or replace the paradigm used for funding at top institutions. The current REU (Research Experience for Undergraduates) and RUI (Research at Undergraduates Institutions) programs at the NSF represent only 2 percent of the math research budget. Programs to enable research mathematicians from nondoctoral institutions to spend sabbaticals at major centers would also benefit these centers by providing funding for mid-career and senior collaborators. If a superstar from Princeton and a lesser luminary from Mediocre State University both visit MSRI for a month, the former may be more likely to produce a significant result. But the opportunity given the latter luminary might have a greater incremental effect on the total research effort.

These are only examples. My concern is not whether or not the AMS endorses a particular program, but that the Society consider the needs of its larger constituency. Those at top institutions may not appreciate the issues faced elsewhere. Indeed, the questions I am most often asked when I attend research conferences are "How much do you have to teach?" and "Do you have doctoral students?" I am not asked "How adequate is your library?", "Does it get *Math Reviews*?", "Are faculty offices on ethernet?", "How much secretarial help do you have?" "Is technical support for work stations provided?", etc. Reports and institutional guidelines from the AMS could be very useful to department chairs (especially those at nondoctoral departments) trying to cope with such issues.

How should the AMS proceed? Not by forming yet another committee, but by increasing the representation of research mathematicians from nondoctoral institutions on committees involved with research, science policy, and the profession. This is essential if the AMS is to fulfill its responsibility to represent the needs of its entire dues-paying constituency in ways that benefit the full mathematics research community.

—*Mary Beth Ruskai*