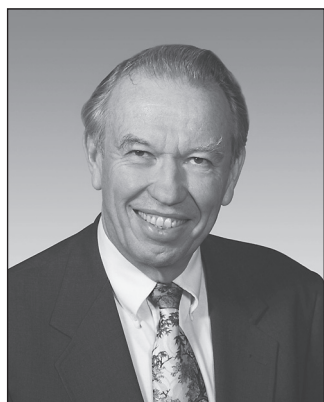


Presidential Views: Interview with George Andrews

Allyn Jackson

Every other year, when a new AMS president takes office, the *Notices* publishes interviews with the outgoing and incoming presidents. What follows is an edited version of an interview with George E. Andrews, whose two-year term as president ends on January 31, 2011. Andrews is the Evan Pugh Professor in the Department of Mathematics at Pennsylvania State University. The interview was conducted in fall 2010 by *Notices* senior writer and deputy editor Allyn Jackson. An interview with president-elect Eric Friedlander will appear in the March 2011 issue of the *Notices*.



George Andrews

Notices: What will you remember most about being AMS president?

Andrews: There are a number of projects that have interested me while I have been president, but the overall importance and significance of the Society and the role the president plays in it are the things that will stick with me the most.

Notices: What are some of the projects you were involved in?

Andrews: When I was asked to run for the presidency—which came as a huge surprise to me—I decided that in writing a candidate's statement I would try to pick out just a few things that seemed

to me to be of major importance, and if elected I would see what I could do with them. To put them succinctly: I am a supporter of a fellows program and hoped to promote that; I believe that there ought to be a program of small grants, especially for mathematicians early in their careers, and I hoped to see something happen along those lines; I am of the "big tent" philosophy, so I hoped to pursue programs that might build new bridges between the three major societies, the AMS, the MAA [Mathematical Association of America], and SIAM [Society for Industrial and Applied Mathematics]; and I feel that questions of mathematics education, especially in the early years, are of supreme importance, so I interested myself in projects connected with that, particularly professional development for teachers.

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Notices: Let's start with the fellows program. Can you first describe the idea of this program, for those unfamiliar with it, and then say what the current status is?

Andrews: The fellows program is designed to create a category of AMS membership called a "fellow", which is an honorary title. Once it is in full operation, the program would name somewhere around fifteen hundred members as AMS Fellows. My personal view is that the program would be a useful thing for the entire mathematics community because it draws attention to people who have contributed substantially to mathematics research. This often has positive effects on awareness and understanding of mathematics by the general public, as well as by members of university administrations.

What has happened over the past two or three years is that the fellows program has been put up for a vote twice in the AMS, and each time it barely lost—it had huge majorities, but not the two-thirds majority that was set as the level at which the program would become a part of the AMS. I have been on a committee trying to design a program that could be put before the membership perhaps in 2011 or the year after. We hope that this new version will address some of the concerns of people opposed to previous versions of the program and that in a future vote it will be accepted. The proposal will be presented to the AMS Council in January 2011.

Notices: The idea of a fellows program has been controversial. Why?

Andrews: There are people who love the idea of the egalitarian nature of mathematics and feel the program would create two classes of citizens. My view is that it is important for mathematics to have awards and honorific titles that allow us

to draw attention to important achievements and good things that we do. So rather than being something that would harm those who do not become fellows, the program in my view would be good for everybody. Obviously it would be good for the fellows, but it would also make clear that mathematics is doing significant and important things, and that is valuable to all of us.

Notices: *Can you tell me about your work on a program of small grants?*

Andrews: There has been no progress at all with regard to my original hope that the National Science Foundation [NSF] might undertake at least a pilot program of small grants. However, the Simons Foundation has recently established a substantial program of small grants [see “New Program at the Simons Foundation”, *Notices*, November 2010, page 1324]. The program is headed by David Eisenbud [director for Mathematics and the Physical Sciences at the Simons Foundation]. I am quite excited about this because it is a big program, something on the order of hundreds of grants. It achieves the sort of thing that I had hoped to see the NSF do, and in some sense it is better than having it done through the NSF, because there are always difficult bureaucratic aspects of dealing with a government agency that are not troublesome with a private foundation.

Notices: *This is something the math community has wanted for a long time.*

Andrews: Everyone I have talked to who has been involved in this makes it clear that this sort of suggestion has been in the air for decades, and as long as we were dealing with the NSF, it has for various reasons gone nowhere. So it is very encouraging to see that this is going to take off from a private foundation. The program is not explicitly devoted to young mathematicians, but it is clear they will be the chief beneficiaries.

Notices: *What about your efforts to build bridges to the other societies?*

Andrews: There are two efforts that I made, and the thing that I am most pleased about is that the AMS will now have a presence in the MAA MathFest. The AMS and MAA sponsored a joint summer meeting until the 1990s, when the AMS pulled out. We have had no presence at the summer MathFest since then. Now there will be a jointly sponsored AMS-MAA hour talk at the MathFest and probably a special session to go along with it. The MAA was quite receptive to this proposal, and the first such talk will be, I believe, at the next MathFest in summer 2011. I am hoping that I can facilitate a similar program between the AMS and SIAM, to have an AMS presence at the SIAM national meeting, but that is not in place yet.

I have also been working with the presidents of the MAA and SIAM on another effort. The presidents of the three organizations for these last two years were all on the faculty at Penn State in the early 1990s, so we are all old friends. We have

been exploring the idea of a joint reciprocity relationship among the societies. There are a variety of financial problems connected with this, so it is still under negotiation. It's not quite clear whether it would be a classic reciprocity relationship or something else, but we hope that something can be done to encourage more people to be members of all three societies.

Notices: *Mathematics education is another thing you paid attention to during your presidency. Can you talk about what you did in that area?*

Andrews: In the time I have been president, two national organizations—the National Governor's Association and the Council of Chief State School Officers—decided to put together a committee that would produce a set of national K–12 standards. I was one of the early readers of at least part of the proposal. It has turned out reasonably well in terms of substance. There are things that bother me about it, but not so much that I am seriously critical of it.

My main concern—and one of the reasons I am not as thrilled about it as some people are—is that it is a top-down effort. All that will come out of it is more or less a curriculum and curriculum recommendations. I believe that professional development programs that address the substance of what teachers know—especially elementary school teachers—are much more important. If you have teachers in the classroom who are not up to speed in terms of substance, it doesn't matter what the curriculum is; it is going to be a disaster. On the other hand, if you have teachers in the classroom who really are mathematically capable and comfortable with the mathematics they are teaching, they can rise above a curriculum no matter what it is.

The professional development program that I have concentrated on most heavily is Ken Gross's Vermont Mathematics Initiative. I am doing what I can to encourage that program to be more nationally oriented and to support efforts to obtain funding for a national roll-out.

Notices: *I have heard of Gross's initiative but I don't know much about it.*

Andrews: It is a three-year master's degree program for in-service teachers. The teachers spend time in the program each summer and then one weekend each month throughout the academic year. I visited one of these weekends about a year ago, and I was struck by the care with which the program had been put together, by the dedication of the instructors, but most of all by the motivation and enthusiasm of the in-service teachers. I have taught the mathematics course for elementary school teachers at Penn State, and those future teachers are not thrilled with mathematics and not particularly motivated. The contrast between them and the in-service teachers in Gross's program was the contrast of night and day. The program has

been in place for ten years and has measured the increase in achievement by students taught by the teachers who have graduated from the program. There is a significant difference and an especially significant one for the children coming from disadvantaged homes. This program is something that actually works.

Notices: *We have covered the four major points from your candidate's statement. Let me ask about something else. The job market for young mathematicians is very difficult right now. What can the AMS do?*

Andrews: When I was contemplating running for president, the economy was fine, and the job market had not collapsed, so that was not on my list of things I thought I would be concentrating on. Certainly the AMS has at least tried to do a few things. For example, Jim Glimm put together a workshop that we ran just prior to the last national meeting to provide at least hints about and directions for possible retraining so that people could enlarge their job opportunities outside academia. It is very difficult for the AMS to have much impact here because we don't have a lot of money. We can't enter into the job market ourselves and sponsor a lot of postdocs or something like that. We have the AMS Centennial Fellowship, and some people have proposed that we ought to start another fellowship. But that's a microscopic drop in a huge bucket. So the main thing we have been able to do is to offer things like this workshop and to continue running the Employment Register. Just by the nature of the problem, the AMS will not have a major impact.

Notices: *The ICM [International Congress of Mathematicians], which you attended as AMS president, took place in August 2010 in India, the native land of Ramanujan, whose work has been of great interest to you. Did that meeting hold special significance for you?*

Andrews: This was my fifth visit to India. Every other time I have been there, I have been heavily involved as a Ramanujan scholar, but this time my role was quite different, namely, I was there as president of the AMS. There were various aspects that were connected to Ramanujan. There was a film crew making a documentary related to Ramanujan, and I spent one full morning on camera being interviewed. There was an impromptu session of people interested in Ramanujan, which of course I attended, and I also gave an impromptu talk. I suppose the most striking thing that went on at the conference related to Ramanujan was the presentation of the play *A Disappearing Number*, which has been playing in Europe and was simulcast this fall in the United States. Through that play, all of the ICM attendees got some education as to the life of Ramanujan.

Before I went to the ICM, I contacted James Tooley, who wrote the book *The Beautiful Tree*,

which is about private schools in the slums of various poor countries throughout the world. I wanted to see these schools in operation, so while I was in Hyderabad his assistant took me to four different schools. It was a very heartening experience, because the schools seem to be making the best of a financially difficult situation. It was interesting to see their success and to see the contrast between how mathematics is taught at the elementary and secondary levels in these private schools and how things are done in the United States. I would say the most striking difference, put simply, is there is much more of what one would call rote learning in India than one typically sees in the U.S. today, at least in elementary education. In a way, that visit had a very strong Ramanujan significance for me because he was someone born into poverty in India and rose to great heights. It was interesting to see the ways in which the poor in India are in some sense managing to help themselves in emerging from poverty. India is an up and coming country. It's a very exciting place. While there is lots of poverty, there is also lots of hope.