

Presidential Views: Interview with Felix Browder

Every other year, when a new AMS president takes office, the *Notices* publishes interviews with the current president and with the president elect. What follows is an edited version of an interview with AMS president Felix E. Browder, whose term ends on January 31, 2001. The interview was conducted in October 2000 by *Notices* senior writer and deputy editor Allyn Jackson. The *Notices* plans to carry an interview with president elect Hyman Bass in the March 2001 issue.

Notices: *The main activity of your presidency was the organization of the meeting "Mathematical Challenges of the 21st Century", held at UCLA in August 2000. What reactions did you get to the meeting?*

Browder: Everybody was remarkably enthusiastic. Everyone was tremendously impressed, including people who I think didn't really expect it. I think they found this a very interesting meeting, because it exposed some of the strongest points on the contemporary mathematical scene. I was especially gratified that 160 young people were able to attend the conference thanks to a grant from the National Science Foundation, which supported their travel. The meeting was an important contribution to focusing the attention of the mathematical world on what probably are some of the most important trends and developments in mathematics. I am now working to try to get the speakers to write up articles for the conference proceedings to put this forward in a more long-lasting way to a general mathematical audience. One can argue that there were things that were not covered. I'm going to try to recruit articles from people who didn't speak, to cover some of these things, at the same level of quality. After all, we could have easily tried to secure forty speakers.

From my point of view, one of the things I wanted to do was to demonstrate that there is a very fundamental synergy between research mathematics—the frontier in the most advanced, strongly achieving areas—and the important potential areas of application of mathematics in

other disciplines and in the world at large. To a large extent I think we did that. I regard the conference as symbolic of a broader set of issues: the future of mathematics, the sense of its unity, and the sense of its connections with its potential applications. What we tried to do is to bring together some of the most prestigious mathematicians in the current period who are working on some of these issues and whose voices would be taken seriously. You could have a lot of people talking about some of these things, but without the weight of the prestige of these people, I don't think the mathematical community as a whole would take such presentations as seriously. That was an important consideration in the kinds of speakers we chose. Some people suggested to me their friends: "I want my friend Mr. X as a speaker; he needs exposure." That's not the principle on which we chose. This was not a political exercise to help anybody, anybody at all—including me!

Notices: *There was a letter to the editor of the Notices by Lenore Blum, protesting the small number of women speakers.*

Browder: We had a much higher rate of declination among women who were invited than among men. Of the women who were invited, 60 percent declined. That's a lot. We invited 5 women, and 2 accepted. And of the men, altogether 43 were invited, and 28 accepted.

Notices: *Do you agree with what Blum wrote, that the small number of women speakers sends a bad message to young women mathematicians?*



Felix E. Browder

fortunately some of the ones we tried to get declined. But that should not discourage young women mathematicians.

Notices: What else besides the UCLA meeting did you work on during your presidency?

Browder: One thing that took place during my presidency, though I was not personally responsible for it, was the decision by the NSF [National Science Foundation] to sponsor a national mathematics initiative, a special concentration on mathematics in the NSF budget in fiscal years 2002–2006. This is an initiative of Rita Colwell, director of the NSF. The fact that it was approved by the National Science Board [on October 19, 2000] is a very important fact, not just in terms of getting money for mathematics, but in terms of raising the visibility of mathematics in the federal landscape. This will raise the visibility of mathematics in all institutions, including the universities. It will help make administrators in American universities conscious of the importance of mathematics as a component of the intellectual and institutional landscape.

This is a very important initiative from the point of view of the basic sciences. They have been arguing for years that there should be an initiative in basic, fundamental scientific research, as opposed to initiatives on very specific and applied objectives. Past initiatives, and present ones, include information technology, nanotechnology, and biocomplexity. We have been arguing for the fact that there ought to be initiatives that are not tied so sharply to immediate applications and technologies. This mathematics initiative, although some of it will impinge on applied research in various domains of mathematics, will be the first initiative centered on a basic discipline. At the same time, it's clear that it's going to have a major interdisciplinary component, because it's going to be related to hybrid mathematics as applied to many problems and objectives in other sciences, engineering, and medicine. One of the reasons

Browder: No, I don't agree with that. I don't think we should have a quota system for speakers. We were very anxious to get women speakers and would certainly have been happy to have more, but you can't run a conference of this sort on the basis of quotas. That gives the impression that the role of women is a political question, and I don't think that the future of women in mathematics is well served by making this a political issue. Basically, we tried very hard to get women speakers, and un-

that Rita Colwell is sponsoring this is that she believes mathematics has a tremendously important future role in biology. I think she expects that mathematicians will get strongly involved in that.

Many people worry about this because of the strong emphasis on interdisciplinary activities in mathematics. Many people want to carry on the old, noninterdisciplinary activities and are disturbed by a potential challenge to the pecking order in mathematics. I'm not sure what the pecking order is anyway. Some people have very preconceived notions: "It's what I am doing, and my friends are doing, and my immediate neighborhood." What's clear is, that is not the way it's going to be. And I think we have to live with that.

Notices: What problems do you see facing the mathematical community today?

Browder: One thing I have observed is the tremendous damage done to individuals by their losing grant support. This happens to people of very high stature across the field. NSF now supports 70 percent of all federal university grants in the mathematical sciences, pure or applied. Funds in mathematics have not been going up—hopefully this will improve as the national initiative goes forward. However, there are lots of people of extremely high caliber who are not being supported, and for many people this does tremendous psychological damage. They are often demoralized by losing their grants. The whole grants system is intended to encourage mathematicians to be more productive at a higher level. The system of summer support, which essentially supports at this point nothing else, is peculiar to the United States. No other country on earth has tried to organize its mathematical activities using these principles. In fact, in many countries, people don't understand why we adopted it. It has its positive features: it encourages university administrators to take mathematics more seriously than they are accustomed to taking it. But at this point I am not sure that its negative features may not outweigh the positive features.

Notices: This seems strange, because people don't go into mathematics thinking, "I'm going to get a summer grant."

Browder: But they acquire a certain ethos that tells them, "This is the way your work is measured." In many departments this is often the way the work is measured.

The panels that assess grant proposals at the NSF are very conservative. They have to be. They have to certify that the problems that these people are working on are in some sense clearly and unequivocally important problems. And quite frankly, some of the most interesting things are outside this framework. I don't know how you deal with that, but it's a very difficult situation. I'm just disturbed by the fact that when people receive negative judgments on their grant proposals, they

are often very deeply psychologically disturbed by it. It may in fact damage their motivation and their creativity.

The AMS sees it as one of its prime missions to argue for research support from the NSF. Why should people who don't get research grants in mathematics see this as an interest of their own? In fact, it's a small fraction of the domestic membership of the AMS who have research grants—it might be less than 20 percent. There's a simple answer, that even if you don't get a grant, the extent to which the NSF and other agencies support mathematics has a tremendous impact on the way institutions, particularly universities and other institutions of higher education, perceive and react to mathematics and its importance within the framework of those institutions. If mathematics is taken exclusively or primarily as a service discipline to do elementary teaching, it will not receive enough resources to survive as a meaningful enterprise. It will not receive strong support in terms of its research and graduate training activities.

This is related to something that I've been complaining about for years and years. Mathematics departments make no systematic effort to have their seniors and beginning graduate students apply for NSF graduate fellowships—as opposed to the economists, who get four times as many fellowships as do the mathematicians. I can tell you that on the whole the mathematics students are superior. Mathematicians do a short-sighted calculation: "My students are not good enough to get these fellowships, and nobody who is going to get these fellowships will come to my department. Therefore, what interest is it of mine?" They fail to understand that the number of fellowships given in mathematics—which means the amount of encouragement given to people to be interested in mathematical careers at this level—depends completely, totally, without any other conditions, on proposal pressure. The group interest of mathematics as a profession depends vitally on the number of NSF fellowships given in mathematics. What matters to mathematics as a whole is that we need four times as many NSF fellowships in mathematics as we get now.

It is extremely important to encourage bright young people to stay in mathematics, and part of that encouragement is to try to get inducements in terms of things like fellowships up to the right level. And this is not understood. Some departments may think that if many students get these fellowships, then the best students who might apply to them for support might not come, but go instead to the more prestigious schools. There is a way to cure this. You can supplement NSF fellowships. It's perfectly legal. Don't practice any principle of egalitarianism. Try to buy the best students!

Notices: What else did you work on as president?

Browder: One of the big emphases was to be very strongly involved in the international posture of the AMS and of American mathematicians in the world community. We should regard ourselves as a world community of mathematicians, and while we have certain competitive situations with respect to other countries, this is much less important than what we have in common. The AMS and the American mathematical community have been very active in some cases in trying to help solve the problems of other mathematical communities, particularly in Russia, after the collapse of Communism. The support for science and mathematics almost vanished in Russia. The situation in Russian universities is deteriorating to an alarming extent. The AMS can't solve their problems for them, but we do give them assistance.

One of the things that went on when I was president, though I had only partial responsibility for it, was the establishment of relations with the European Mathematical Society, which is a coalition of around fifty national mathematical societies in Europe. Also, I have taken it as a principle that during my term as president I would go to every joint meeting that we have with another society or group of societies. This included meetings in Australia, Scandinavia, Mexico, and Hong Kong. These meetings reflect the fact that, despite many differences, we all have a common interest and a common problem: the welfare of mathematics and encouraging the lives and activities of mathematicians throughout the world. Mathematics is an international activity; there is no "national" mathematics distinct from one country to another. There are different national traditions, different strengths in different areas. But in general, almost every kind of mathematics has been worked on, and significant contributions have been made, in many different countries. Many people see competition between different societies and different communities, and some competition does exist, but I don't regard this as very important compared to our common interest. This is an important principle that the Society does and should continue to operate on.