Communicating with Congress: An Interview with James H. Turner Jr.

In recent years the mathematical sciences community has greatly stepped up its efforts to advocate increased federal funding for basic scientific research. The AMS Washington Office has been a key player in these efforts. One of the office's main activities is establishing and maintaining relationships with members of Congress and their staffs who have an influence on funding for science.

James H. Turner Jr., chief Democratic counsel for the Committee on Science of the House of Representatives, has become an important figure in the community's relations to Congress. With a bachelor's degree in mathematics and over twenty-five years' experience as a congressional staffer, Turner has a keen appreciation of the need for strong support of the mathematical sciences and a deep understanding of the legislative process.

The House Committee on Science is an authorization committee, which means that it drafts legislation to set spending policies that guide appropriations. The Committee on Science has the responsibility of writing the authorization bills for several federal agencies that fund research, including the National Science Foundation. Turner is a member of the committee staff, which develops legislation for the committee, monitors other bills that have a scientific component, and works on coordinating science funding across the government.

What follows is the edited text of an interview with Turner in which he discusses the outlook for research funding and how the mathematical sciences community can build effective relations with Congress. The interview was conducted by *Notices* senior writer Allyn Jackson during the Joint Mathematics Meetings in Phoenix in January 2004. Assistance during the interview and in preparing the final text was provided by Samuel M. Rankin III, director of the AMS Washington Office.

—*A. J.*

Notices: *What is your prognostication for funding for science in the next few years?*

Turner: I think it is very much an open question. Some of the people who were the longtime advocates of science funding are no longer in Congress. There is a new group that has stepped up, and whether they are going to be as effective as their predecessors remains to be seen. Also, it is not entirely clear what the administration's positions are going to be on various issues after the election. President Bush seems to be committed not to roll back any of the tax cuts, so the amount of money that the government will have will not increase and will probably decrease. A compounding factor is the growth of the federal deficit. I don't think there is anyone who believes that the size of the deficit can continue at the levels it is in the indefinite future. These factors put pressure on science funding. That's the bad news. The good news is, first, that hopefully the economy will improve and, second, that the science community is organized much more than it was as recently as ten years ago. The mathematics community is a very integral part of and one of the organizers of the new regime.

Notices: *So you have seen a real change in the capability of the scientific community to affect science funding?*

Turner: Yes, very much so. There are several changes that took place. In 1995, when the Republicans came to power, one of the things that happened was that the Office of Technology Assessment [OTA], which was one of the main sources of advice to Congress, was abolished. Fortunately, the scientific community, including the American Mathematical Society, has stepped in to fill that void. Under the leadership of Dr. Rankin [Samuel M. Rankin III, director of the AMS Washington Office], there have been one or two sessions every year where distinguished mathematicians make presentations to as many as one hundred members of Congress and staff about how mathematics relates to important issues like the biological sciences or cryptography or image recognition. OTA did very little related to mathematics. Now that the American Mathematical Society has stepped in, I think there is more of an opportunity for the Congress to understand the contributions that mathematics makes. A second area is events like Congressional Visits Day, which was started about the same time. The American Mathematical Society has been one of the participating societies. On Congressional Visits Day scientists and mathematicians come to Washington to meet with members of Congress. So there are some positive effects as well as pressures we are under.

James H. Turner

Notices: *The outlook for mathematics funding at the NSF became much rosier when Philippe Tondeur became the director of the Division of Mathematical Sciences there.*

Turner: There were certain things that happened. During his tenure there was specifically a mathematical sciences initiative. The question of whether another initiative can follow on to that —we are about ready to enter into the final year of that initiative—is problematic, because there are a lot of other disciplines that have needs as well.

So it is important for mathematicians to participate in the process at various levels. It is important for more mathematicians to get to know their home district congressmen—and senators, if possible. The purpose is not just to go in and ask for more money, but to make sure that congressmen—who make many of their decisions based on how they affect the local area—know what is happening in their universities and how mathematics and science play a role in economic development; in having a high-quality workforce; and in preparing people in the social, physical, and biological sciences, which are becoming much more math-intensive. The world is becoming much more quantitative, and that knowledge doesn't happen by accident; it comes by hard work and by having opportunities available.

Notices: *Do people from other sciences go to see their congressmen more than mathematicians do?*

Turner: If one considers how big the mathematical societies are as a percentage of the total scientists and engineers, mathematicians probably are at or above average. But the mathematical societies are a lot smaller than, for example, the American Chemical Society or the Institute of Electrical and Electronics Engineers. The fact that those societies are perhaps ten times as large means that there are a lot more things they are capable of doing. This also means that it's important for the mathematical societies—as they have done—to be partners with other scientific and engineering societies. Part of the message is the importance of mathematics, and part of the message is the importance of mathematics, science, and technology in general, because if the overall science funding goes up, funding for mathematics will probably go up.

Notices: *It's hard for pure mathematicians to explain their work to their congressmen. How can they express to people in Congress that what they do in pure mathematics is relevant and useful?*

Turner: There are any number of examples of mathematical discoveries that have been made in the past that are now becoming relevant. If you look at telecommunications, the Internet as an example, there are a number of things that were discovered through basic research that have been put to use. The pure mathematicians you mentioned can call on the parent societies for such examples. Also, they do not necessarily have to talk to the member about what they are doing, but about what mathematics is doing in general. It's not necessary to sell just one's own research.

If I am at a university like Yale University and I go in to see my congressman, the congressman is not going to see me as an individual. I am going to be seen as a member of the mathematics department at Yale and also as a person who is, in this example, employed at the largest employer in that congressional district. So what I am representing is a research university where mathematics, the sciences, and engineering may be the hope of the future of that congressman's area. It's the source of talented workers; it's the source of ideas that are spun off. Most of the congressmen thank their lucky stars that those institutions are in their districts. So part of the sale has already been made by whom you are representing—especially if you visit the member when he or she is back home.

It may not be a customary position to be in, but to a certain extent what you are being is a salesman. Anybody who is being a salesman has to know what his or her customer needs and cares about and to adapt arguments accordingly. It is very rare for a congressman to know a lot of mathematics. Most of them are lawyers or English majors or history majors. But it is equally rare for a congressman not to be very smart, and because of the nature of their jobs, they have been exposed to a wide variety of ideas and opinions. So they have the ability, even if they are not analytical, to put things in context in a way that a lot of people are not able to do. The congressional staff, who would in most cases be younger and less experienced than their congressman, operate in the same spirit and are trained to think very broadly and understand a large range of issues.

It's very important for scientists who want to help in this way to work closely with the Washington offices of the mathematics societies, which can provide resources and advice. You are certainly not alone when you do it. You are part of a very big team that is trying to educate a finite number of people on the importance of mathematics, science, and technology. You'll be successful, as you are in any team effort, if you work as a team and build on the strengths of your colleagues.

Notices: *What about the argument that mathematics is valuable just intrinsically as an intellectual discipline? Does that argument resonate with congressmen at all, or do you always have to say, "mathematics is useful in technology"?*

Turner: One thing that is important to remember is that what mathematicians think about on a daily basis and what congressmen think about on a daily basis is usually very different. If your daily life is made up of ten or more meetings with lots of diverse groups and you are voting on different kinds of legislation every day that Congress is in session, then you are pulled in many different directions and are not thinking in-depth on a particular issue in the way a mathematician is. So that means that things that are intuitive and obvious to a mathematician are going to be things congressmen never think about. You may well be the first mathematician who engages the congressman in a conversation—usually they are talking to businessmen in their district or to the Kiwanis Club. They are going to be interested in how mathematics affects their lives. But you are only going to get twenty or thirty minutes to make your presentation, so you have to be very organized. Sometimes you hit the jackpot and you spark an idea that really leads to broader thinking. That won't happen every time; maybe it won't happen often.

One congressman I worked for said that the two most important things to remember when you are dealing with Congress is, first, that Congress is an oral society or, if you will, a debating society, and, second, a good story rather than a good fact is the currency of the realm. So if I were going to make a presentation to a member, I would not spend my time explaining my work. I would think about stories about how mathematics in my district made a difference or, if I am trying to sell something that is a broader bill, examples of how mathematics has made a real difference economically or in scientific discovery. A good example currently is the Mars lander. I'd be very surprised if more than a handful of members of Congress really realize to what extent that is not only an engineering enterprise but also a very complex mathematical enterprise. There is always something current in the news where mathematics has made a contribution.

Notices: *How important do you think the issue of homeland security and the antiterrorist effort is in influencing funding in mathematics?*

Turner: My personal opinion is that it's going to be a fair amount of work, but that is one of the real targets of opportunity. The Department of Homeland Security was forged from many disparate agencies, some of which had research operations. A variety of scientific endeavors came into the department, but they are not an integral whole. The legislation creating the Department of Homeland Security created an undersecretary focused mainly on research and development. So there is at a high level a very logical place for mathematics to enter into the Department of Homeland Security. The other thing that is happening, which is unique among agencies at this time, is that that department is in a formative stage and growing rapidly. Part of the funding will be spent through an analog to DARPA [Defense Advanced Research Projects Agency], which has funded some mathematicians in the past. Some of the research will be funded, I am sure, with individual investigator grants. I would not hold my breath for there to be a lot of basic research there. But when you think about the kinds of problems that the Department of Homeland Security has to wrestle with, many of them have a mathematical basis. So if I were king of the American Mathematical Society—I realize you don't have that position yet!—this is one of the things I would really be concentrating on.

Notices: *What about the huge advances in biomedical science? Do you think there is potential for the mathematics budget to rise along with increases in funding for biomedical science?*

Turner: That is a little tougher situation. I think the answer is yes, but yes over time. I don't think mathematics people have gotten anywhere near the credit they should have for these advancements in biology. But biologists are becoming more and more dependent on mathematical knowledge. I think it is a natural progression for mathematicians to be more frequently on teams that are applying for NIH [National Institutes of Health] grants. The idea of having a source within NIH where individual investigators in mathematics can apply is really a tougher sell. It will take time, considering that there are so many interests already at the table and that the budgets there are not growing as fast as before. Mathematicians will benefit in direct proportion to the extent that biologists realize that mathematicians have solutions to their problems.

Notices: *Do you think that mathematicians who are visiting congressmen with the aim of increasing research funding should bring up math education?*

Turner: Oh, absolutely, because math education is one of the easiest issues for members to understand. It can be an ice breaker; it can be a good source of anecdotes. The only caveat is that if you have a limited amount of time, you can only break so much ice, and you have to get down to what the real purpose of your visit is.

I think mathematics and science education also is a wonderful way to build a relationship with a member in your home area. If your area has an exceptional program, on the day it's being shown off, why not invite your congressman to introduce the math teachers or come meet some math students in a competition? It's an opportunity for the congressman to get his picture in the paper, and it's an opportunity for you to get in the press—so it's a win-win situation.