

Interview with George Csicsery

George Csicsery is the producer and director of the film *Julia Robinson and Hilbert's Tenth Problem* (see movie review, pages 573–575, this issue). The following is an interview with Csicsery, conducted on February 19, 2008, by *Notices* graphics editor Bill Casselman, University of British Columbia.

Notices: *How did you come to make this film?*

Csicsery: The idea for this film came in 1998. Charlie Silver, a logician and a friend, sent me an email in which he summarized the idea of the film for me in a few enthusiastic paragraphs, beginning with “While waking up this morning, I had a flash of a math film” In the rest of his email he outlined much of what eventually went into the film.

Charlie had helped me a great deal while I was making *N is a Number: A Portrait of Paul Erdős*,

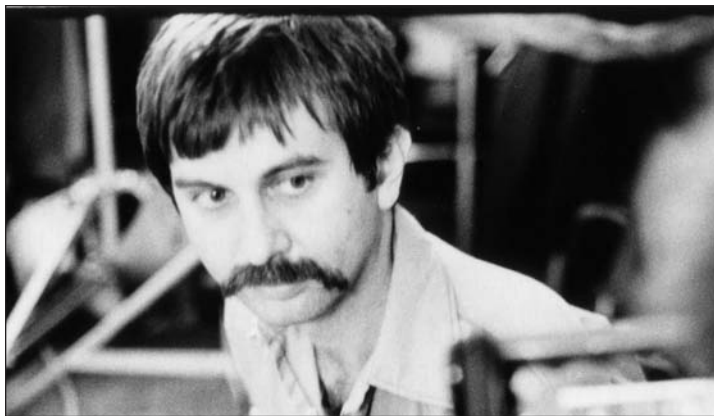
you consider that she had already written, or co-written, Julia Robinson’s autobiography, *Julia: A Life in Mathematics*.

My main conceptual contribution was to tell the mathematical story inside the biography of Julia Robinson. And this proved to be the most difficult part—making the two parts move forward in tandem so that neither would subtract from the other.

Notices: *How did you get interested in making mathematics films in general?*

Csicsery: That’s a question I get often, since I’m not a mathematician and my understanding of mathematical ideas is rather primitive. Just as often, my official answer is that I’m a refugee from the social sciences looking for terra firma. And this is only half a joke, because in my lifetime there has been terrific erosion in the quality of work being done in what used to be called the social sciences, and more precisely the fields in which I was best trained—anthropology, sociology, comparative religions, and history. My interest in mathematicians, rather than mathematics itself, was sparked by hearing and reading about individuals who had a passionate dedication to finding out things that might actually be close to truth. There’s a second part to this. My films about mathematicians are also films about people who found ways to overcome the less pleasant aspects of life. Paul Erdős and Julia Robinson are both interesting exemplars of the life of the mind prevailing over the daily travails that consume most people.

Constance Reid was already a legend in mathematics, being the pre-eminent biographer she is. I always felt that she is an important part of the story in her own right, independently of Julia Robinson. Constance also had a wonderful collection of photographs taken by their father. She made these and countless other artifacts available to the project.



Photograph courtesy of George Csicsery.

George Csicsery filming in 1977.

and he’s worked extensively on the films of Errol Morris. He had been a student of Julia Robinson at Berkeley, and knew her. As he explained it, the story of how Hilbert’s Tenth Problem was solved came to life for me.

When I agreed that the story was compelling, Charlie flew out to California and we went to visit two people together. One was Constance Reid, the other Martin Davis. Both of them embraced the idea for a film and agreed to participate. In a sense, Constance, being Julia Robinson’s sister, became her surrogate in the film. This is not so strange if



Photograph by Helen Moore, courtesy of George Csicsery.

Some of the people involved in the making of the Julia Robinson film, including Kirsten Eisentraeger, Yuri Matiyasevich, Alexandra Shlapentokh (top row, first, fourth, and seventh from left), George Csicsery (front row, third from left), Bjorn Poonen (to the right of Csicsery), and Martin Davis (standing, third from right). All of those named appeared in the film, with the exception of Csicsery.

Martin Davis is one of the four people credited with solving Hilbert's Tenth Problem. He had worked with Hilary Putnam, then with Julia Robinson, and then later, with Yuri Matiyasevich. His descriptions of the other participants and of events turned out to be key parts of the narrative, shedding light not only on an important piece of mathematical history, but adding color and nuance to the characters.

About a year into the process I was able to meet Yuri Matiyasevich at a Hilbert's Tenth Problem meeting in Gent, Belgium. Here was the man who had actually succeeded in solving the problem in 1970, and then, overcoming the immense political barriers between the U.S. and the USSR at the time, went on to forge a creative partnership with Julia Robinson and Martin Davis. Is there anything more dramatic? Matiyasevich proved invaluable to the film. The deep sincerity and intense emotion with which he addressed every one of my questions reveals a great deal about him. He brought another gift to the project—his own 8mm films from 1970 and 1971. His first presentations of his solution to Hilbert's Tenth Problem were filmed, and he had the footage, which you see in our film. In 1971 he also filmed about one minute of scenes with Julia and Raphael Robinson at the Bucharest mathematics meeting where they first met. As far as I know, this is the only existing piece of film with Julia Robinson in it.

Notices: *What were the trials and tribulations involved in making this film?*

Csicsery: The biggest challenge for most documentary films is funding. The second is finding

an audience, or in the case of a film like this one, creating an audience. The third is actually making the film. Of course, these three things are intimately connected.

I started working on the film with no funding because Constance Reid was flying to St. Petersburg, Russia, in January 1999 to celebrate her birthday and the anniversary of the solution of H10 with Yuri Matiyasevich, and I thought this should be covered. It was frustrating to say the least; I paid a Russian crew to follow them around, but in the end could not afford to go myself. Talk about remote directing. Well, as you can imagine, there is very little footage from that adventure in the finished film. Then I was committed. I kept shooting from 1999 through about 2005 with no resources. There were two or three times when I was working on projects for MSRI [Mathematical Sciences Research Institute] and would be shooting an interview with someone who figured in Julia Robinson's story as well. I asked David Eisenbud, the former director of MSRI, if I could shoot an extra roll or two for the Julia Robinson film. Fortunately, he always said yes. Finally, in 2005 I got a decent grant from the Clay Mathematics Institute, followed by two more. And in 2007 we got a generous grant from the Margaret & Will Hearst Foundation. As a result we were able to schedule the final shoots and complete the editing. The film premiered at the Joint Mathematics Meetings in San Diego in January 2008.

The challenge of finding an audience for the film seems mitigated by the terrific outpouring of interest from mathematicians and teachers. I can only hope that this will lead to some television broadcasts. It's hard to be optimistic about TV though;

even the best science series have been dumbed down to accommodate the fleeting attention spans of viewers. If you've seen the film you can appreciate that it takes more than five seconds to grasp some of the concepts.

Finally, there was the challenge of actually making the film. The film has three threads: the biography of Julia Robinson, the history of how Hilbert's Tenth Problem was solved, and some quite demanding mathematics. Weaving these together into a single narrative without sacrificing any of the bits was possibly the hardest task I've ever attempted. To be honest, I'm still not sure how well we succeeded. I worked with a superb editing crew consisting of film editor Tal Skloot, and assistant editor/ animator Andrea Hale. We also had the best available mathematical consultants, many of whom are in the film, and had worked—or still work—on some of the ideas we had to find ways of presenting on screen. It's an impressive list of names: Martin Davis, Yuri Matiyasevich, Solomon Feferman, Hilary Putnam, Lenore Blum, Bjorn Poonen, Steve Givant, and several others. And Charlie Silver was always there in the background, making sure that I would keep the balance between making a coherent film and maintaining some fidelity to the mathematical ideas.

Notices: What did you enjoy most about this film and the earlier one about Erdős?

Csicsery: With Paul Erdős I got the feeling that I was in the presence of a rare and wonderful human being who happened to be one of the greatest mathematicians of the twentieth century. The people around him are impressive enough, but he had a special quality that inspired. I actually felt that he was not eccentric at all; that his approach to life made absolute sense.

Julia Robinson died in 1985, interestingly, at a hospital less than 100 yards from my home and office. We never met, and this posed another challenge for the film. I had to get a sense of her from Constance Reid and from her colleagues and students. In the end, I think we succeed in presenting not only the facts, but also a flesh and blood human being. I hope that her voice, her writings, the dozens of photographs, Yuri's footage from Bucharest, and the stories in the film about her, do bring her to life.

In both cases, however, I was never quite sure until very near the end that the films worked. You spend years on a project, and during that whole

time it's impossible to explain to people why you have chosen such an arcane subject. People seem to question your grip on reality, and sometimes you start suspecting they may be right and that you're wasting your time on a futile effort that was doomed from the outset. Then you show the film, and people with no interest in mathematics come up and say they got something out of it. And when you ask what that might be, they tell you the exact thing that you had in mind when you set out to make the film. That is rewarding.

Notices: Can you tell us a bit about your own background?

Csicsery: I was born in Germany in 1948. My parents were refugees from Hungary, and we came to the United States in 1951. They sent me to a six-year boarding school in Buffalo, New York, that had been founded by Hungarian refugee priests who had run some of the best high schools in Hungary before the war. From there I went to Berkeley in 1965, and got to experience the full blast of the 1960s. While I did earn a B.A. in Comparative Religions four years later, the Berkeley-in-the-Sixties experience probably accounts for how I kept up my careers in journalism and film. I've been making films since 1968, most of them documentary. There are so many themes that it's hard to detect a thread, but with *N is a Number: A Portrait of Paul Erdős* (1993) I got typecast as a biographer of mathematicians. It's a terrific niche; there's not a lot of competition.

Notices: Do you have any future projects planned involving mathematicians?

Csicsery: We just finished a feature-length documentary about the 2006 U.S. International Math Olympiad team. *Hard Problems: The Road to the World's Toughest Math Contest* also premiered in San Diego at the JMM in January 2008. It's available from the MAA on DVD. This was really a different kind of project for me, and I really enjoyed it. It's a great experience to work with the very brightest high school students, and to watch them stop and think before they answer a question. I think the film provides a glimmer of hope about the next generation.

During 2008 I hope to finish a small piece about Paul Halmos for the MAA that I started in 1999, and there are a few other projects in the planning stages that I'd rather not discuss. Somewhere down the road I would love to make a film about Coincidence.



Above: Still shots from the Julia Robinson movie. Top to bottom: Julia at 3, as a young woman, and shortly before her death.

Photos courtesy of Zala Films.