MATHEMATICIANS AND MOZART

GRADUATION TALK

May 17, 1985

According to Salieri, God himself speaks through the divine music of Wolfgang Amadeus Mozart. Mathematicians can learn many things from the story of Mozart—about creative genius, mediocrity, ego, professional rivalries, and teaching. In this talk I would like to share some of my own experiences on these issues.

Let me first look backwards to my student days at Toronto and Princeton. Three messages stand out clearly. The first was from H.M.S. Coxeter, a famous geometer at Toronto under whose guidance I wrote my first paper—a small result in projective geometry. He showed me the value of encouraging and cherishing the creative spirit in students, no matter how humble their project. The second message came from Eli Stein, the world renowned analyst from Princeton. He told our incoming graduate student class that mathematics is a big subject—don't try to master everything, but do try to be knowledgeable about a wide variety of topics. The third was from Solomon Bochner—bless his heart for passing me in the German exam. He told me to learn as much as I could while I was young, because once I started teaching, administering, advising, and raising children, it would be very hard to learn new things. He was right.
I will now offer five pieces of my own advice. First of all, have respect for creativity and have reverence for the true creative genius. Like Salieri, recognize and cherish genius. Unlike Salieri, do not let your ego or professional jealousy try to destroy it. Adding to and passing on our mathematical heritage is what we are mathematicians for. Those whose creative talents compose the most beautiful new works of mathematics deserve our highest praise.

Second, if you teach mathematics, take your job seriously; teach compassionately, but with high standards. Mozart passed on his musical treasures through his written work, his performances, and his students. We pass on our mathematical heritage through our written work, our lectures and our students. I recall a colleague saying "it is bad to be a good teacher—you should give disorganized and unprepared lectures so the students are forced to think." Another told me "if you are a bad teacher, then you get assigned the best courses." There are a lot of excuses for bad teaching—yes, that's right, they are excuses.

My third point is to avoid isolation. Stay in contact with the applications of mathematics and with your colleagues in other fields. Mozart's music was composed to be heard. As renowned photographer Brett Weston stated, "My pictures speak only when we both listen." One way mathematicians isolate themselves is by judging other subjects, such as physics, engineering and education, using the values and ideals of mathematics. I have had the privilege of seeing mathematics from both inside and from outside—the two views can be quite different.
Fourth. Be honest. Nowhere are mathematicians more dishonest than in writing letters of recommendation. Shortly after arriving at Berkeley, I was on the personnel committee, which is responsible for appointing new professors. One of the first files I looked at had a letter comparing the candidate favorably to Gauss. I said, "hold everything, 'cause we got a winner." A more experienced faculty dismissed the issue by saying "forget it; he always says stuff like that." In one of our student's files you can find a letter recommending them to graduate school. The professor stated, and he was quite serious, that this student was already better than any of his colleagues. After thinking about it, I realized that one wasn't necessarily a good letter. An English colleague of mine always adds a note to his letters of recommendation: "please note," he says, "this is an English letter of recommendation; that is, it is honest." Did you know that Mozart gave a recommendation for Beethoven? His own words: "keep your eyes on this young man; some day he will give the world something to talk about." In 1787 this comment really meant something. Would it mean the same today?

The fifth. Pursue the highest standards in your work; don't always believe what you read or hear--ask basic questions. Of course, I don't mean for you to challenge everything--for example, it is probably unproductive to go around saying you don't believe Stokes' theorem. But it is healthy to challenge the research literature--unfortunately, under the pressure to publish, many incorrect and undeveloped papers get into print. One of my engineering colleagues from Stanford has an interesting solution to this problem: Every academic should be allowed to freely publish whatever, whenever and wherever they please with no refereeing or editorial roadblocks; the catch is that they are allowed to publish no more than 20 articles of 100 pages each in their lifetime.
After seeing the movie *Amadeus*, perhaps some of you believed what you saw concerning Mozart's death. Did he really drink and work himself to death? Don't trust what you read or see! Let me tell you one of the facts the movie left out. Mozart loved his students—He especially loved Magadalena Hofdemel, and revealed much of his love in *The Magic Flute*. Magdalena's husband, Franz, who was a patron of Mozart, caught on. A day after Mozart was buried, Franz committed suicide and had injured Magdalena. Mozart himself believed he was poisoned. Was it Franz Hofdemel who did it?

But this is 1985 and you are graduating today. From here you will pursue a variety of professions. No matter what you choose, I hope the passing on of my own experiences will be of value to you: respect and nurture creativity, teach with devotion, reach out to your fellow colleagues, value honesty and uphold the highest standards.

On behalf of the Department of Mathematics, I want to say: we are proud of you. You are the product of our efforts, your efforts and your parents' efforts. Mozart's parents, Anna Maria and Leopold, nurtured and trained him until he was a master composer. From this foundation his work flourished. With your foundation, combined with diligence, your work will also flourish.

Jerrold E. Marsden
Professor of Mathematics