(Speaking in favor of) Redundancy, Inefficiency, Extravagance, and Waste.
Annalisa Crannell
Franklin & Marshall College
January 8, 2008

The title for this talk is taken from a phrase that appears in an excellent-but-obscure essay written in 1980 by Kenneth Boulding (former president of both the American Economic Association and the American Association for the Advancement of Science).


I love this paper, but I have to warn you that there are many ways in which this a peculiar talk for me to give.

Take the first two words: *redundancy* and *inefficiency*. I’m a person who carries this planner with me everywhere. If I need a new part for one of my home appliances, I’ve got the model and serial numbers listed here. I keep all my meetings and to-do lists in here. All of them. No post-it notes. I don’t even hold formal office hours; instead I train my students to sign up for appointments by writing their names in this book.

I can describe the philosophies and practices of the major time management/organization gurus of our time (Stephen Covey, Hyrum Smith, Julie Morgenstern, David Allen), and—as my husband will tell you—at the slightest provocation, I will hold forth on the strengths and weaknesses of each of their approaches.

People have used a lot of adjectives to describe me, but I’m guessing that no one has ever said “inefficient”.

What about *extravagance* and *waste*? One of my friends, at a party at my house, once explained to everyone else there that whenever they were around me and described buying anything, they should add the phrase, “for which I paid too much.” She herself had just told me that that she’d paid $2.50 for a child’s rain coat (for which, she added as she looked my way, she paid too much). I told her that in fact, I could imagine circumstances under which someone might actually want to pay that much for a kid’s raincoat, although I myself seldom pay more than $1.00 (and usually half of that or less) for my own children’s clothing. Or for mine, for that matter. I think I paid 50 cents for this dress. (You didn’t really need to know that).

I do my own plumbing repairs; I cut my family’s hair; I’ve been known to repair umbrellas with used chopsticks . . . so even in a profession as famously frugal as math, I’m a bit of a tightwad. So I seem like an unlikely person to speak in favor of extravagant and waste . . .

But I will anyway, although I’ll take a circuitous route.
I’d like to use this time to reflect on what we do and who we are. We often confuse these two things; people ask, “So, what do you do?” and we answer, “I am . . .” “I am a taxi driver, an accountant, a teacher, a doctor.” My husband earns his money by writing and doing public relations, but at heart he is a bicyclist, a joke teller, and an acolyte of C.S. Lewis.

Mathematicians are fortunate because these two things—what we do, and who we are—very often closely coincide. We do mathematics; we are mathematicians. Mathematicians will say things like, “we get paid to do what we love”. Some even go so far as to say we’d do this even if we didn’t get paid for it. You laugh, but if you come to meetings like this, you’ll see this sentiment borne out by the number of retirees who are present. Retirees from business don’t go to trade shows; they go to the golf course. But “retirees” from math do go to seminars and conferences. To me, looking at these colleagues of mine says awfully good things about the way I’ve chosen to spend my life.

So that’s a fifth thing that you should know about me: the first four are that I’m not redundant, inefficient, extravagant, or wasteful (at least in the usual sense), and the fifth is that I am, gosh darn it, a mathematician.

Now let’s turn to teaching.

When we try to convince others that they ought to verb math (where for “verb” you could substitute “learn”, “appreciate”, “use”, “fund”, “love”, among others), we do so along two standard lines of argument. Here they are, in their full Aristotelian glory:

Math is beautiful.
Math is useful.

There you have it, form and function, some details omitted. This pair always reminds me of a poem by Joanne Growney.


Each one I meet I ask, “do you find mathematics beautiful or useful? All answer, “Useful. I use math every day.” My eyes reveal that I want proof, and each goes on to tell that she subtracts to keep her checkbook, and sometimes multiplies of find the size of carpet for the dining room.

If I, instead, would say, “Do you find beauty or utility in poetry?” would each person say, “It’s useful. I use it every day.”
For proof would she go on to tell
that rhymes help her remember
the number of days each month --
like “Thirty hath September” --
and spellings of words with “i” and “e.”

Someday utilitarians
will join with me to see
beauty in mathematics --
and in poetry.

We tell our students that their lives will be richer if they major in mathematics -- even if they just take a few more courses in math. We tell them that Calculus is a subject that changed the way we look at the world, so that they can’t fully understand modern discourse if they don’t understand Calculus. We tell them that they are at college to become well rounded, so they should add math to their mix of courses. We tell them that, you never know, later on in life, when you might actually want to use this stuff.

So here’s where my talk departs from the usual. Because we could take out the word “math” and replace it with just about any other academic subject, and it would still be true.

Archeology is beautiful.
Archeology is useful.

Organic Chemistry is a subject that changed the way we look at the world, and we can’t fully understand modern discourse if we don’t understand it. You never know, later on in life, when you might actually want to speak another language. Our lives will be richer if we study even a little philosophy.

By saying this, I don’t mean to denigrate mathematics in the slightest. (I see Joe getting ready to jump up and take away my award!). I do believe that mathematics is fundamental and eternal in a way that no other discipline is. I agree with Galileo, who wrote that mathematics is the alphabet with which God has written the universe.

But I think we do a real disservice to our students (and to ourselves, but I’ll get back to that later) if our last serious intellectual encounter with anything outside of mathematics happened during our senior year of college. Paradoxically, if our own intellectual lives are “all math, all the time”, we face a lot of challenges when we try to woo others into our discipline.

One of these challenges is that that we’ll be seen as “out of it”—that we love math (they think) because that’s the only thing we’re good at. Our assurances that mathematics is beautiful and useful are merely self-serving ignorance, sort of like parents trying to advise teenagers on which clothes to buy. What do we know?

Another is that we’ll be seen as hypocritical—after all, we tell our students that we are training them to become life-long learners. What must they think of our urging them to take math courses not required for their major or intended career if we ourselves long ago stopped learning anything outside of our own major, our own career?
A third, and I think most important, challenge is that we lose out on the chance to engage our brightest students in an academic territory where they are comfortable, to have a substantive conversation about Shakespearian tragedies (or whatever it is that turns them on) before we try to drag them into our lair. My pastor often reminds us, “people don’t care what you believe unless first they believe that you care.” My freshmen don’t care what I believe about mathematics unless they believe that I care about them. Learning more about what our students are learning about gives us the chance to show that we care and understand. And then we can snag them and get them into math.

These are some reasons why I think our own academic breadth is important for our students. But what about for us?

So, a mathematician, an astronomer, a philosopher, and an anthropologist walked into a sushi bar. This sounds like the beginning of a joke, but in fact it’s actually something that happened to me. When I first got to F&M, the nearest sushi place was one-and-a-half hours away in Philadelphia. Four of us young (and very hip, or so we thought) professors decided one Friday to road trip out there together. We had a long time to chat in the car. Because of something that had come up at a recent faculty meeting, I asked everyone, “If you had to miss a class to go to a meeting, how long would it take you to explain to someone else in your department how to take over?” I know for me, for calculus, the answer would be “less than 5 minutes”:

*We’re doing section 3.7, graphical interpretations of the derivative. Draw a few graphs with secant lines and let delta-x go to 0. Have them do a couple of examples from the end of the section.*

Done.

The astronomer said that he’d have to have the physicists take over; they’re less familiar with his materials so it would probably take 15 minutes. But the philosopher and the anthropologist both balked at the question. You couldn’t get someone in to cover your class—you’d just have to cancel it. The anthropologist studied Bali, and that’s how she structured her Intro class, and no one else in the department knew that area. The philosopher finally conceded that if she were doing a week-long, completely self-contained unit on, say, Plato, and if the other instructor would do that whole week, well then maybe that would work. Maybe. But one class, no.

From this I learned that introductory classes in some other fields are as specialized as research is in ours. In fact, later on, the anthropologist and philosopher got to express amazement that although the mathematicians in our department are nearly interchangeable at the undergraduate level, even we don’t understand one another when we talk about our research. They were even more amazed (and I must admit, jealous) when they found that at our conferences, other mathematicians come up after the talks to offer encouragement and helpful advice, rather than to challenge the speaker’s thesis. Students think of math as competitive and the humanities as cooperative, but at our conferences, you’d see that the reverse is true.

That night was one I’ve remembered and treasured for a dozen years now.
I’ve had the opportunity to join a multi-disciplinary book group on evolutionary biology. Every year, we pick a new book to read together and discuss over lunch on Fridays. Historians, geologists, French professors, and even biologists weigh in on the evolutionary origins of altruism, on how geography influences human societies, and on sexual selection (did human beings evolve our intelligence because deep thinkers are more attractive to our potential mates? The deep thinkers at our table would like to think so.)

One year, after I got tired of sitting in the waiting area every week while my daughter took her dance lessons, I hired one of my friends who teaches dance to come over to our home once a week and give us “family dance lessons.” We cleared out space in the garage and everyone from my 2-year-old son and my three daughters to me and my husband -- plus, quite often our neighbors -- learned the swing and the samba. It was fantastic. You should try it.

Each one of these experiences—the sushi bar, the evolution lunch, the family dance classes—has been an intellectual and personal joy. Like traveling in a different land with a different culture, spending time with my colleagues from other disciplines opens my eyes to their world, and to my own as well. My experiences have changed the way I teach and the way I talk to my students. And by changing what I do, these experiences also change who I am.

Okay, here I am talking to people who are teaching and grading and serving on committees and trying to keep their research going and perhaps even having personal lives and trying to exercise and doing all those other things we think are important, and I’m adding yet another task to your to-do list. How do I propose you do it?

I could argue by induction: there’s always room for one more thing on your schedule.

I could argue along the lines of Hilbert’s Hotel: If you just move all the nth things on your to-do list down into the 2nth position, you’ve just opened up an infinite amount of odd free time to schedule things into!

I could even argue that our mania for “balancing” different parts of our lives (like balancing teaching and research, or balancing work and family) compartmentalizes them in ways that are harmful to us. As those of you who have brought your kids and other loved ones along to San Diego can attest, it’s possible to integrate—rather than merely balance—our personal and professional lives, or our learning and our lunch lives. We can do things differently, instead of just doing more.

But instead of explaining how to do it, I’d like to just add my plea that we do. There are sociologists at our institutions, but I think mathematicians should study sociology. There are artists at our institutions, but we should paint and sculpt. There are economists where we work, but we should read about economics. Here is what economist Kenneth Boulding said about a life of broad intellectual inquiry and curiosity.

“It may well be that the only answer to this problem is redundancy, inefficiency, extravagance, and waste.
he went on:

One could argue indeed that the main reason for getting rich, that is for economic development, is that it permits the human race to indulge in these last four delights.”

Let’s all get rich together.