Mathematics and Creative Writing

Chandler Davis, University of Toronto; Marjorie Senechal, Smith College

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The need to create a poetic-dramatic-narrative literature around mathematics is widely acknowledged by mathematicians and non-mathematicians alike. Yet creative writing about the content of mathematics is extremely rare, and creative writing about the act of mathematical creation even rarer. Despite the lively current interest in mathematics on the part of the non-scientific public, much creative writing in and about mathematics today reinforces the insider/outsider divide. The entrenched presupposition that artistic creation is unrelated to mathematical thought still endures, though some writers are struggling against this bias in various ways. Any effort to address these daunting challenges is necessarily experimental. We were encouraged by the statement on the Banff Centre's website, promising "freedom to experiment, with the knowledge that we learn from our failures as well as our successes. It is hoped that everyone will feel comfortable taking risks and challenging assumptions, creating new and unlikely alliances...."

For BIRS's first creative writing workshop, we brought together mathematicians, and non-mathematicians, all of whom are actively engaged in creative writing related to mathematics. In addition to professional mathematicians who also write, the group included non-mathematicians whose work concerns, or engages, mathematical thought: a playwright/director, a playwright/composer, a biographer, a poet, essayists on mathematical art, and a journalist.. Interests ranged from mathematical exposition to dramatization of the world of mathematics (both the people and the concepts) to exploring the relation between mathematics and poetical esthetics.

In planning this workshop, we also deliberately mixed genres: exposition, biography, poetry, theatre, journalism, fiction and nonfiction, in the expectation that the mix would prove stimulating. (Indeed it did.) We expected all workshop participants, whether they identified themselves primarily as mathematicians, scientists, or writers, to be seriously engaged in a writing project consonant with our theme, willing to discuss some of their work-in-progress, and willing to subject their writing to others' reactions. We also asked them to circulate some of it (published or unpublished) well in advance of the meeting in Banff. (Most did, but not "well.")

As this was BIRS's first creative writing workshop and also our own, we decided not to plan the program in detail in advance. The mix of fifteen accomplished, creative, and (possibly) egotistical characters would, we thought, catalyze the most effective format. We did anticipate that part of each day would be given to group activities (modeled on writing workshop exercises), part would be presentations and discussion of work-in-progress, and part would be unscheduled.

As it turned out, most of the scheduled time slots were devoted to individual presentations. Briefly:

Marco Abate, a mathematician at the Universita di Pisa, spoke about his widely read comic adventures with mathematical themes; **Colin_Adams**, a topologist-geometer well known in the American mathematical community for math-related satire, read several unpublished pieces; **Barry_Cipra**, a versatile free-lance writer on mathematics, both for mathematical and for general audiences, talked about ethical issues in mathematical exposition and journalism; **Florin_Diacu**, author of several

expositions on his field, celestial dynamics, and its history, read excerpts from a nonfiction book in progress;**Ivar Ekeland**, known for his overlapping accomplishments as a mathematician and a writer, read his forthcoming children's story, *Cat in Numberland*;**Claire Ferguson**, a writer on mathematical art, read some of her essays on the mathematical sculptures of her husband, Helaman Ferguson; **Emily Grosholz**, professor of philosophy at Penn State, poet, and Advisory Editor for *The Hudson Review*, led a discussion on aesthetics and read some of her poetry;**Paul Hoffman**, author of *The Man Who Loved Only Numbers*, the best- selling biography of Paul Erdos, read and discussed a chapter of that book, and also gave a public lecture on his more recent *Wings of Madness*;**Ellen Maddow**, composer and playwright (including a play featuring a woman mathematician) and her husband, playwright and director **Paul Zimet**, founders and leaders of the New York repertory company Talking Band, presented selections from videotapes of their play, *Star Messengers* (a music theatre production about Galileo and Kepler);**Bob Osserman**, a differential geometer and an advocate and practitioner of "humanistic mathematics" discussed an article-in-progress on Costa surfaces; **Osmo Pekonen**, a mathematician and prolific writer on math and other things and co-author of the first Finnish translation of *Beowulf*, discussed his film on early expeditions to measure the length of a degree of latitude;**Kameshwar Wali**, physicist and writer, author of *Chandra*, the biography of the astronomer Chandrasekhar, read selections from his book-in-progress on the history of violins;**Marjorie_Senechal**, mathematician, writer, historian of science and technology, and workshop-co-organizer, discussed the "closet drama" she is writing about Louis Pasteur; **Chandler Davis**, mathematician, editor of *The Mathematical Intelligencer*, quondam science-fiction writer, poet, and workshop co-organizer did not take a time slot, as we had run out of them, but sparked the discussion throughout the four days.

The advance circulation has already produced one intriguing development: Ellen Maddow, inspired by Marjorie Senechal's article "The Symmetry Mystique," began writing a play based on symmetries (she presented a few early draft scenes at the workshop.) Marjorie persuaded her to extend "symmetries" to aperiodic tilings, such as Penrose's. Ellen has since applied for a partnership grant to continue this collaboration.

As we predicted, the value of the feedback was enhanced by the fact that many of the critics had backgrounds very different from the presenter's. As nobody was there in the role of teacher and nobody as student either, everyone was expected to come forward with criticisms; and every presenter had to be receptive to criticism and tolerant of criticism issuing from misunderstanding. The non-mathematicians were more used to this than the mathematicians (criticizing or being criticized for errors in mathematics is one thing, criticizing or being criticized for creative writing quite another), but we all improved in these respects as the workshop proceeded. Next time, we will emphasize this more explicitly, and also stress the fact that mathematicians must seek to learn what creative artists know (but may not know how to say) about artistic creation. At the same time, non?mathematicians must welcome being told when their productions miss the point mathematically. Next time we will be more insistent on our expectation that, at the workshop, participants present only work in progress, not work in press or already published. While published work can, and did, show us a wide breadth of possibilities and serve to introduce us to each other, both presenters and critics learn much more if the criticism might have an effect. Just as importantly, criticizing published work is a different enterprise, more like a newspaper reviewer or drama critic.

We agree that the workshop was a success and its objectives were achieved. The harmony among participants – who in many cases had had no previous contact and whose backgrounds were different – was extraordinary. Something was l earned about writing?cum? mathematics by everybody. We are planning the April 2004 workshop on the same general model, with some of the same participants (for an intended total of twenty rather than the fifteen), though modified a bit in accordance with our remarks above. We expect that the second workshop will be even more stimulating and conducive to future creative work.

We have not included a bibliography with this report, as technical mathematics was not the main focus of this workshop, but we will be glad to supply one if the Committee feels it would a useful addition. Although all of the workshops participants are well-published writers, there is, we agreed, a paucity of outlets for the kind of creative writing we are trying to encourage. We believe there is a public waiting to be engaged in mathematical ideas, but agents and publishers tend to be skeptical.

One topics we will continue to explore in future workshops is ways of identifying and educating these essential middlemen, and also what contributions *The Mathematical Intelligencer* might make (for example, a participant suggested that the Intelligencer hold annual creative writing competitions in each of several genres).

A note on interaction with the Banff Centre: in our early planning, and in consultation with Carol Holmes, Director of the Banff Program in Writing and Publishing, we intended the 2003 workshop to run simultaneously with one in the Banff Writing Program and to interact with it (indeed, that is how the date was selected.) Unfortunately, this partner workshop had to be canceled. We, and Carol, still believe strongly that both programs would be enhanced through intensive interaction with the other. To that end, we have applied for a joint BIRS/Writing Program workshop in 2005 with forty participants, twenty selected by each. Obviously, if this larger workshop takes place, we will have to modify our format somewhat: it would be impossible to achieve the intimacy of a group of twenty in a group double that size. However, as the participants will be selected in part on the basis of overlapping interests, we are confident that the program can be successful with a mix of simultaneous and plenary sessions.