ATTENDING

DAVID PIMM, LAURINDA BROWN

Laurinda: This last issue of my editorship is special, or at least different. On August 3rd, 2006, I sent an e-message to a range of advisory board members, each paired with another, inviting them to have conversations on suggested topics as a stimulus to producing eventual pieces of writing, some of which are included here (crows reporting on new mud). We had such a conversation, *Transforming*, FLM **23**(3), which appeared in my first issue as editor having taken over from you.

David: I've just re-read that piece, which I find is quite autobiographical, but it also focused on some technical issues about what is involved in editing a journal. Do you have some observations four years later, looking back on your time as editor?

Laurinda: On the inside-front cover of FLM, one stated aim is "to generate productive discussion". I was struck when we wrote *Transforming* by the awareness you had of David Wheeler knowing "how little echo there was to be heard". I can remember trying to set up structures so that there would be more potential for responses from readers. Where possible, I have tried to publish articles as pairs, so that they speak to each other in some way. I have also aimed to publish a conversation in each issue of the journal as a response to Barton's comment in **23**(3) on why he liked an interview between Ascher and D'Ambrosio in **14**(2):

> One of the things that we as mathematics educators do not do enough of, it seems to me, is to expose ourselves in the formation of our ideas, theories, […] two senior

people in the field of ethnomathematics […] exposed their initial fumblings with the intricacies of their field […]. I remember clearly that it gave me the impression of theories in formation, as opposed to theories that exist, or theories that are to be used. (p. 30)

When I was considering whether to do anything special with my last issue, inviting conversations seemed to be in support of that aim.

David: It's certainly interesting having access to others' views of and connections seen between articles. I say this while bearing in mind David Wheeler's caveat delivered on page 3 of this issue, about editorials that simply point out "things that he or she [the editor] wants the readers to find in the issue".

Laurinda: Whatever, I'm taken by Edward Doolittle's question "can we substitute 'mathematics' for 'horse'?".

David: And here are a couple of pointers of my own.

In the Hackenburg/Sinclair piece, I enjoyed how they had started from Frisch's observation about technology in relation to experience and then had taken it in quite a different sense from the one I had had (namely that his was an ironic observation about how technology gets *between* humans and direct experience).

A second was how in the Stocker/Wagner piece they cited Devlin's subtitle "making the invisible visible", but it was Klee writing about *art* not mathematics who coined that phrase. This recollection connected me to the Knoll/Reid piece about parallels and non-parallels between mathematics and art, while *Parallelisms* was the title of Hermann's psychoanalytic take given in the Tahta piece about Cantor.

Laurinda: Two of the conversations you mention were developed out of Working Groups at different Canadian Mathematics Education Study Group meetings. The culture of these working groups is one of exploration and discussion, fitting with the aims of FLM, and, although for the other issues of my editorship there has been a strong and continuing international representation, the majority of the pieces here, I note, are from Canadian authors. Images of the collaborative work in these groups reminds me of Dubiel's call "Everything worth doing is hard", and it's also do-able, supported by the social, which is maybe part of overcoming the "math is hard" label for students.

David: This is how well we have remembered David Wheeler's warning. Let's stop making links now. But nevertheless, I think we have been illustrating the making of connections, not laying down the ones that *should* be made.

Laurinda: An image that comes to mind is of FLM acting as a lodestone and the editor tending that attraction. Lodestones are also sometimes called "way-stones", of use in guiding mariners on the open ocean. From the inside-front cover of the journal, the intended FLM audience is "aware that the learning and teaching of mathematics are complex enterprises about which much remains to be revealed and understood." In editing the journal, I have been aware of attending to authors who work through questions exploring ideas rather than those who, in Keats's words, are "reaching after fact and reason".

David: I have a related image of a successful journal acting as a touchstone, a provider of criteria (originally used as a means for testing gold or silver by the colour of the mark each metal made on it). Part of the sensitivity of a journal to submissions involves the response offered, both in terms of selection but also in terms of subsequent reactions and allusions that appear in print. And of course people can act as lodestones or touchstones, as well as journals.

Laurinda: I think that a "more collegial feel to the journal" has developed, something I had hoped for in our earlier conversation in **23**(3). Each member of the Advisory Board has had a role in supporting the responses to authors within their area of interest and some of the group have also taken the role of shepherding articles through the review process. Brent Davis, as Associate Editor, has read every submission and commented on it! For you and David Wheeler, it must have felt that you were the keystone of the journal, someone on whom all else depends, whilst for me it has felt like a growing community.

David: It's the function of the keystone (or bondstone), which often does not look any different from any other stone, to lock the whole together. It is also put in last. One of the things I still miss four years on from editing FLM is the putting together of an issue and the prolonged period of close attention to the writing required. There are always other outlets for such attending, but editing a journal seems to me to provide this opportunity in a particularly clear and pronounced form.

Laurinda: In the last paragraph of the previous conversation you and I had in **23**(3). I invited communications from readers who had read Mazur's book *Imagining numbers*. Dick Tahta provided a written response in **24**(2), whilst others responded in conversation attracted by the idea of "absence of time in mathematics". And that reminds me that when I sent out the initial murder of crows, the invitation was for you and Dick to talk about psychoanalytic aspects of mathematics learning and adolescence as a starting point. When Dick died in December 2006, you were left without your 'other' and I've stepped in for this conversation partly because of symmetry, my end being my beginning, and partly because we both knew Dick so very well. I was also curious about the conversation you two had started to have.

David: In the eight months since Dick's death, I have found myself turning more than once to the question of my 'reader', asking who the audience is for what I write. Not the empirical reader (most of whom authors never meet or hear from), nor even perhaps Eco's 'model' reader (the one whom pedagogic texts serve to create), but in some sense the fantasy reader, the one who to a greater or lesser extent is in the writer's mind as the person being directly addressed.

Halmos, in his extensive contribution to the Mathematical Association of America monograph *How to write mathematics* declared:

> I like to specify my audience not only in some vague, large sense (e.g., professional topologists, or second year graduate students), but also in a very specific, personal sense. It helps me to think of a person, perhaps someone I discussed the subject with two years ago, or perhaps a deliberately obtuse, friendly colleague, and then to keep him in mind as I write. (p. 22)

Thinking in detail about this was also triggered by re-reading a passing remark in Netz's *The shaping of deduction in*

Greek mathematics (how "the death of a single person seriously disrupts the network", p. 285) in his discussion of mathematical friendships and how relatively few mathematicians there were in Ancient Greece. Netz cites a letter from Archimedes to Dositheus:

> When I heard that Conon, who was my friend in his life-time, was dead, but that you were acquainted with Conon and withal versed in geometry, while I grieved for the loss not only of a friend but of an admirable mathematician, I set myself the task of communicating to you, as I had intended to send to Conon. (p. 285)

I found this significant for a number of reasons. Dick and David Wheeler each were Conon to the other's Archimedes. Following David's death in 2000, I had become one of Dick's numerous Dosithei (in matters psychoanalytic in relation to mathematics). After Dick's death, I had not only lost my responder for this conversation, I had also lost my fantasy reader. Yet, over the past eight months, I find I have written more than in any comparable period in the past decade.

Lying behind this musing is Bakhtin's insistence in claiming every human utterance is addressed *to* someone, a phenomenon he termed *addressivity*, namely an orientation toward the other.

> An essential (constitutive) marker of the utterance is its quality of being directed to someone, its *addressivity*. As distinct from the signifying units of a language – words and sentences – that are impersonal, belonging to nobody and addressed to nobody, the utterance has both an author (and, consequently, expression as we have already discussed) and an addressee. This addressee can be an immediate participant-interlocutor in an everyday dialogue, a differentiated collective of specialists in some particular area of cultural communication, a more or less differentiated public, ethnic group, contemporaries, like-minded people, opponents and enemies, a subordinate, a superior, someone who is lower, higher, familiar, foreign, and so forth. And it can be an indefinite, unconcretized *other*. (p. 95)

And I have been wondering about the addressivity of mathematical text: who is Pythagoras's theorem uttered to?

Anyway, in asking me to share the beginning of the conversation, I simply wish to mention I am very conscious of matters of audience. Well, here it is.

The beginnings of a conversation

David: I'd like to suggest two possibilities, both of which I'd like to work on with you. The first is your reversal of the Poincaré question about why would anyone want to give themselves to mathematics. The second is about dreams. I've been wondering about "the return of the repressed" with regard to the dreams of the mathematician. I have just tripped over the new Cixous translation entitled *Dream I tell you* (the 'you' is purportedly Derrida). It is a collection of fifty or so of her notes on her first-waking dreams, with an extraordinary preface of ten pages (one small gem from there is referring to Freud as "the Shakespeare of the Night"). Do either of these seem of possible interest?

Dick: A relative quickie, because I have to spend a day in hospital tomorrow – to discuss impending treatment next week. So I am trying to clear some decks now.

About a possible conversation. I'd be happy for you to carry on with my reversal of the Poincaré question. I imagine us exchanging e-mails for a while. Then, perhaps contributing to FLM some edited version. I assume that you will in due course weave in your interest in dreams, or even start a separate hare. I think I would need you to tickle my interest in all that to start with. I will probably do the same in terms of my current attempt to cope with Zizek on *The parallax view* ("the confrontation of two closely linked perspectives between which no common ground is possible").

Here is an opener for you to consider.

> How is it that there are so many minds that are incapable of understanding mathematics?

I start with the famous question posed by Poincaré. He went on to express his surprise that a discipline which appealed to logic – "the skeleton of our understanding" – could seem so obscure to most people. A century later, after much development and improvement of mathematics education, it seems that the subject remains not only obscure and uninteresting, but also somewhat terrifying, to what is still a majority of people.

When people who report negative feelings about mathematics are asked why this is so they often refer to bad teaching. But I have never felt very convinced by this, for it seems to ignore that there are many other subjects which people can recall as being particularly badly taught, and which they are not interested in, but which nevertheless do not seem to evoke the same emotional trauma. I can recall really atrocious teachers of, say, history or languages, subjects which I gave up at school as soon as I could, but about which I do not now have any negative feelings.

There is a familiar range of proposed further explanations of the situation. You may recall a discussion of current views in a book by Jeff Evans on adults' mathematical thinking and emotions. This was relatively unusual in that it not only discussed such cognitive issues as failure of transferability and sociological issues about gender, race and peer influence, but it also followed up some proposed psychological explanations of "the aversion of many people to mathematics in general". These were inevitably very condensed accounts which were perhaps hampered by too many references to any relevant current educational research. Thus, the notion of mathematical anxiety tended to rely heavily on what people reported in questionnaires or interviews and such reports do not always help to clarify the very general word 'anxiety', nor tell us much about the personal investment in what often seems like a well-rehearsed and oft-repeated account.

Some very brief reference to early Freudian accounts of anxiety was followed later by a condensed discussion of the interesting psychoanalytical work of Jacques Nimier. The latter has worked on what possibly hidden defenses people may be revealing in their own accounts of their feelings about mathematics. These often tend to be discussed in terms of such things as current family relationships or teacher influence, which have then to be interpreted in some way. Such current external influences are also an important

feature of what Evans calls a "post-structural questioning" of the assumptions of traditional psychoanalysis in such work as that of Valerie Walkerdine. This can veer from observations about sociological context to Lacanian discussions of early experience of loss.

I invoked the work of Evans mainly because I myself do not have the expertise (or indeed the interest) to explore the whole range of possible explanations of the phenomenon I am interested in. So I am struggling in this first communication to try and delineate more precisely a useful area for discussion and further development. I would certainly like to explore some of the things that Nimier and Walkerdine are interested in. But for now I would like to move away from the professionals and go back to someone who posed Poincaré's question two centuries earlier.

In a letter, written when he was nineteen, to his brother George, the poet Samuel Coleridge wrote:

> I have often been surprised that Mathematics, the quintessence of Truth, should have found admirers so few and so languid. Frequent consideration and minute scrutiny have at length unravelled the cause; *viz.* that though Reason is feasted, Imagination is starved: whilst Reason is luxuriating in its proper Paradise, Imagination is wearily travelling on a dreary desert.

He enclosed a poem which was intended to prove his point, and which, "to assist Reason by the stimulus of Imagination", described the first theorem of Euclid's *Elements* on the construction of an equilateral triangle. His doggerel verse is not worth quoting, nor does it show very clearly how Imagination elucidates or feeds Reason in this case. But I am interested in his letter because it raises the question how, why and when any of us might be turned away from either Reason or Imagination. And here there would be the same diversity of explanations. But there is that elusive term "Imagination" and it may be worth looking more carefully into Coleridge's use of the word. It's certainly not like the way it is used, say, in Hilbert and Cohn-Vossen's *Geometry and the imagination*. It suggests to me something more like a way of looking at the world that seems to be set at a very early age (and that is where my own interest mainly lies – I'd hope to give a more personal account in due course). And it leads me to think of the problem about people's understanding of mathematics as not so much a matter of aversion as of disinclination or preference.

Last words
Laurinda: Dick died in December of last year. What would your responses be?

We leave the last entry on this page to one of Brent Davis's images, and welcome him to his term of editorship of FLM.