A. J. (Sandy) Dawson (1940–2015)

Editor's note: *According to the listings inside the front cover of every issue of FLM, Sandy Dawson was a member of FLM's advisory board from volume 11, published in 1991, until his death earlier this year. I valued his wide reading, generous spirit and expertise, as well as, more specifically, his connection with Gattegno, and with David Wheeler. He represented a point of contact and continuity between the 'early days' of FLM and the present day. On being asked for his opinion on a submission a couple of years ago, for example, Sandy replied, "It seems to me that it is one type of article that David Wheeler would have welcomed"; reassuring advice that helps to maintain the spirit of FLM. In this section, two equally long-serving members of the advisory board offer appreciations of their work with Sandy. I am also pleased to reproduce a chapter written by Sandy, originally published in 1991. Since the book in which it appeared is now out of print, I am glad to be able to make this writing available to new readers. It still seems to me to be relevant today.*

What I learned with Sandy Dawson

TOM KIEREN

I, like all of us in the mathematics education community that knew him, was deeply saddened by the death of Sandy Dawson. As I will note below I had a long and varied relationship with him. Perhaps it was because he and Sandra (Sandy's wife) were such avid travelers, that Sandy made himself present (a presence that was positively felt) at a plethora of mathematics education conferences across the globe seemingly every year, as well as at institutions of learning at many levels in many countries. As I will note below, I was always amazed at the wide variety of connections he had personally within the mathematics education community. He seemed to "be up on" the wide variety of "new" work being done in the many dimensions of the field in many different places—never mind the varied and rich work in which he himself was involved. I profited from any interaction I had with him and even as I write this I realize how much my inter-action with him will be missed.

On learning *with*

Right from the start in the 1968-1969 university year at the University of Alberta, I found our inter-actions rich with exploring some idea of his or mine, or some new book or article, often suggested by him. It always seemed to me that our discussions were focused on building new ideas or mathematical learning situations or … both together. For example, in 1990 at his home in Vancouver, he was excited by reading Susan Pirie's and my recent writings on dynamical mathematical understanding and in the midst of our discussion he excitedly suggested that our idea of *folding back* really brought a form of re-writing one's learning history into such mathematical knowing and understanding. In the same conversation he brought my attention to a new book he had read, *The Embodied Mind* by Varela, Thompson and Rosch (1991). This led to an extensive conversation on the way a person's knowing was affected by the environment but necessarily also affected or changed the environment in which the knowing took place. This conversarial knowing with Sandy led to my spending several years trying to see how this view of knowing could help us understand and foster student mathematical knowing and understanding. (Such co-emergent effects of/in mathematics knowing are evident in the situations Sandy has laid out for our attention in his 1991 book chapter, reprinted in this issue).

I think Sandy well lived out Gattegno's idea of *the subordination of teaching to learning.* This key idea in no way undervalues the role of teaching. In Sandy's 1991 chapter, the "teachers" in these situations continually "provide" rich tasks or responses or … which the students can and do take up in their own way; and equally importantly the teachers "attend" to the students' actions, inter-actions and mathematical ideas and use them to challenge these ideas or to further promote/elaborate the students' ideas on which they are working together. Thus, in learning with Sandy I found him to be a *very providing and attentive teacher.*

What follows are a few other elaborations on what I learned *with* him.

On Sandy's doctoral work

When I was asked by the Department of Secondary Education (at the University of Alberta) to be Sandy's doctoral supervisor in 1969 (my very first supervisory role), Sandy had already principally finished his research as well as his writing on the thesis, ably advised by Sol Sigurdson, who was on leave. My task really was to see him through his defence, which at Alberta meant finding a committee and especially a scholar, external to the university, who was an expert in the area of his (then and still) unique thesis entitled "The implications of the work of Popper, Pólya and Lakatos for a model of mathematics instruction". I asked K. O. May from the mathematics department at the University of Toronto, a well-known "polymathic" mathematician, expert in the philosophy of mathematics, econometrics and symbolic logic, who had been my undergraduate advisor at Carleton College in the US. I did this with certain intrepidation, as May was, from my experience, always a rigorous interrogator of one's work. But because May generated my own interest in the philosophy of mathematics and because I thought he would understand and give a very thorough review of Sandy's thesis, I made this selection. When I picked May up at the airport on the night before Sandy's defence, almost the first thing he said, after we reacquainted ourselves, since it had been 7 years since I had been his student, was "This is a thesis I would have liked to have written."

The next day, he and Sandy had a wonderful, principally two-person conversation on all of the dimensions of the thesis during the defence—especially since May had a long-time interest in student mathematical thinking, as well

as thorough knowledge of the work of Lakatos. I and the rest of the committee, including the Dean of Graduate Studies, while adding a few questions of our own, listened and were richly benefitted by the conversation—What a learning with Sandy! What an affirmation of his early work!

On the Gattegno connection and learning with Sandy through it

I have mentioned Gattegno and his influence on Sandy as a person and upon his work. In the late 1960s, I had become acquainted with some of Gattegno's ideas in reading a review of Canadian research on the use of Cuisenaire rods in elementary school mathematics. Conversations with Sandy brought this man and his work alive for me beyond the coloured rods. Sandy had worked in New York with Lakatos and others, especially David Wheeler, in his educational enterprise Educational Solutions. Later, partly through Sandy's influence, I met Gattegno and many others who were interested in his work—David Pimm, John Mason, Laurinda Brown and John Trivett to name just a few. Their work manifested Gattegno's ideas but each in their own unique forms. Ideas informing me and my work were (1) the way in which student-developed patterns in well-thought-out mathematical settings empowered student generalizations as if "for nothing"—taking little or no psychic energy; (2) but such generalizations, can be challenged, revised or changed through elaboration by students making them (see Sandy's 1991 chapter); and (3) the roles of listening, careful attention to the uses of language, and even silence in teaching and learning, and also in researching mathematics knowing. These are but a but a few of the ideas that I learned with Sandy through contacts he helped me make with not only the appropriate literature, but with the generators of such literature themselves.

On learning with Sandy related to CMESG/GCEDM

Sandy was very active in Canadian Mathematics Education Study Group (CMESG), one of the founders of which was David Wheeler, from its inception. I think both Sandy and I resonated with the inter-active format of the meetings, perhaps especially the extended time spent in small task working groups. He also liked the fact that this was indeed a Canadian organization that yet drew international interest and participation.

Sandy was deeply involved in CMESG's efforts to support the 1992 ICME meeting at Laval university—especially in seeing that there was material on Canadian mathematics education research featured for that meeting. It was at the time of that meeting that Sandy succeeded me as president of CMESG. (As an amusing aside, at that ICME meeting Sandy and I represented CMESG at a small Canadian Mathematics Society dinner honouring H. S. M. Coxeter. Sandy, having a vehicle, and I were charged with returning the Coxeters to their lodging. After leaving them he said that we should be glad that we had without mishap transported a Canadian mathematical treasure.) Sandy, along with persons such as David Wheeler, Claude Gaulin and Bernard Hodgson, were instrumental in extending the knowledge of and influence of CMESG well beyond what might be expected from our rather small organization. Because of his extensive personal contacts throughout the world in the area of mathematics education Sandy was a true ambassador for CMESG bringing not only his ideas, but Canadian mathematics education ideas more generally to the world, and always bringing a breadth of ideas back to the Canadian mathematics education community.

On learning *of* Sandy's work *with* the Central Pacific Nations

When Sandy moved from Vancouver and Simon Fraser University to a new base in Hawai'i (PREL) and later with the University of Hawai'i itself (MACIMISE), I only really followed his work there from afar. Nonetheless, each time I met him, he was always brimming with his deep work with mathematics educators in many remote Pacific island nations. I think his devotion to his own well-developed version of subordinating teaching to learning was evident in my reading of his personal reports on his work with teachers and mathematics educators on these islands. His own special combination of well-developed, yet flexible ideas, his gregarious personality and love of life, and his genuine willingness to make room for the other beside him seemed to be a generating force in the development of mathematics education and mathematics educators in that vast region well beyond any normal expectations.

In my own mind this great human mathematical educational work is a living memorial to Sandy's life work, at least as important as his other intellectual contributions to our field. I am sorry he is no longer here to continue building both features of that legacy even in his retirement.

References

Varela, F. J., Thompson, E. & Rosch, E. (1991) *The Embodied Mind: Cognitive Science and Human Experience.* Cambridge, MA: MIT Press.

I Learned from Sandy

UBIRATAN D'AMBROSIO

Sandy Dawson left us when he was full of plans to enjoy his retirement and what he cherished so much: to travel and to learn about peoples and cultures. When he retired, he wrote to friends about his plans, but soon after, he wrote again telling of his serious health condition. His death was a great loss. Sandy was recognized for the excellence of his academic achievements and for his stimulating participation in many events. His academic career and his original scientific and scholarly research contributions to mathematics education in general are presented in many obituary notices. I will add some personal recollections.

I first became familiar with the work of Sandy at the 4th International Congress on Mathematical Education, Berkeley, CA, in 1980. Since then I followed his work closely and attended many of his lectures. His lectures and the conversations with him were always very inspiring. Sandy was an established professor at Simon Fraser University when he joined the Pacific Resources for Education and Learning

(PREL) as a senior program specialist in mathematics education and he developed a special interest in the relations between mathematics and culture.

In 2003, he decided to move to the University of Hawai'i. This move allowed him to devote more time to a large scale teacher training project in the Pacific region—MACIMISE: Mathematics and Culture in Micronesia: Integrating Societal Experiences. I was so happy when he invited me to join the project as a member of the advisory board. MACIMISE was an original project which represented an important step in recognizing ethnomathematics as a valuable strategy for teacher training in the several participating countries. It was a great experience in a collaborative research and development project. The project focused on the indigenous mathematics of ten Pacific island communities, which had different languages (Palauan, Yapese, Chamorro, Carolinian, Chuukese, Pohnpeian, Kosraean, Marshallese, Hawai'ian, and Samoan) and aimed at building local capacity by offering advanced degree opportunities to local mathematics educators.

The main objective, and this was a great contribution to ethnomathematics, was to recognize the mathematical practices found in the local languages and cultures. Since the project aimed to improve the performance of teachers in the Core Curriculum, it was a major step to conciliate this aim with research in ethnomathematics. The project researched and documented indigenous mathematics for use in school curricula and tried to collect evidence that indigenous mathematics contributes to student mastery of mathematical concepts and skills. With this project, Sandy touched a most frequent critique of the introduction of ethnomathematics in school systems. His presentation and discussion of these issues at the 4th International Congress of Ethnomathematics, in Towson, MD, in 2010, made important contributions to these issues. (A personal note: it was not easy to accompany Sandy and Sandra in the excursions promoted by the congress. Sandy's energy, even with his mobility problems, was remarkable.)

Interaction with Sandy in participating in the project MACIMISE led me to recognize many important aspects of the ethnomathematics program. He made it clear that it is necessary to look again into formalism and rigor. The demand for education is increasing in every small country and ethnomathematics can contribute to addressing a number of global challenges facing school systems. Ethnomathematics is more acceptable to native populations, more accessible and more affordable than official school mathematics, particularly for those living both in rural and coastal areas. Since ethnomathematics appeals to traditional practices, it is more attractive than the sometimes cold and austere formal mathematics. This is true also in more developed areas of countries where services are a mix of traditional practices for common needs, relying on specialized workers and artisans, such as builders, as well as specially trained professionals, in commerce, technical services and industries. Ethnomathematics relies on what people are doing in their everyday life. A well-functioning school system could balance local ethnomathematics and official school mathematics. The two systems need not clash and can blend together in harmony. There may be an effective improvement for school mathematics, but also an improvement of the practice of ethnomathematics, which receives a valuable contribution from theoretical reflections provided in schools.

History tells us that the evolution of basic mathematics, which is the basis for school mathematics, reflects changes of culture, including language, and social, political, economic, ideological and religious factors. The same is true for the evolution of ethnomathematics. The complexity of situations and problems, which determine the generation of traditional ethnomathematics, changes and, as a consequence, the solutions proposed must also change. Ethnomathematics is as dynamic as much as academic mathematics and every other system of knowledge. We have to recognize that new methods and new facts will be absorbed and incorporated by ethnomathematics. As long as an abundance of new facts, phenomena, situations and problems require ethnomathematical solutions, ethnomathematics will be alive. A lack of evolution of ethnomathematics foreshadows the extinction or the cessation of its development. The cultural dynamics of encounters show that ethnomathematics, which is holistic, transdisciplinarian and transcultural, benefits from academic mathematics. We need to modernize the rich resource and cultural heritage of both ethnomathematics and academic mathematics and to put them in their proper places in today's world. This is one of the many lessons I learned from Sandy.

Sandy Dawson Ethnomathematics Education Scholarship Fund

The University of Hawai'i, College of Education, is accepting donations to the Alexander J. "Sandy" Dawson Ethnomathematics Scholarship Fund. In order to continue his important work in mathematics education throughout the Pacific Region, the College wants to build a $35,000+ endowment in Sandy Dawson's name. If the endowment level is not reached, the College will create an expendable scholarship fund that can be used to ensure availability. Donations can be made "In Memory of Sandy Dawson." Make checks payable to UH Foundation and send to:

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