Communications

A Mathematical Humanity [1]

DAVID HAWKINS, FRANCES HAWKINS

David Hawkins: I first met David Wheeler during 1960-1 while spending a year's sabbatical leave in Leicestershire, England. David was teaching at the University of Leicester then. I was working on the Elementary Science Study (ESS) examining school developments, among many other things looking at Leicestershire's innovative ways of organizing over-size science classrooms. These involved different stations and teachers circulating, which made a big difference in the ways science and ordinary physical materials (such as fabric) were used

David invited me to talk to a week-long course of mathematics teachers (the first group that had invited me to speak about mathematics) and I brought something they hadn't seen before. (Polya showed it to me and he himself attributed it to Leibniz [2]) It involved graphing the whole numbers *n* on the *x*-axis, and its corresponding set of divisors on the *y*-axis. There are various patterns in this two-dimensional array just made with dots on graph paper: for instance, just before a square number, you can see a small parabola opening to the left.

Anyhow, David's work with secondary students involved a liveliness about investigative mathematics even then. He and I found a feast of agreement about certain things and hit it off immediately, first at a professional level and later as friends, though friends who were destined not to see each other very often. We had various scattered meetings (the last one was in Vancouver the year before he died) and exchanged ideas by letter and through the pages of this journal. We never lived long enough near to one another. I remember seeing him at a meeting in Québec, which was about geometric solids, regular and semi-regular ones – partly geometry, partly pedagogy, which excited us both.

Something came from a discussion we were having about people in the seventeenth century – Leibniz and Spinoza and especially Toricelli, concerned with different world-views. I remember telling him of the difficulties Toricelli had in getting someone (eventually it had to be in France) to take his invented barometer up a mountain, an experiment for us with hindsight to see the effect of altitude on air pressure. Behind this, of course, lay the collision of world-views about how the air was related to the earth, whether air was throughout the universe and we passed through it or whether somehow it was carried with us. David was so interested in and appreciative of the intellectual difficulties of those who came from one way of thinking having to work their way into another. He was always concerned with a marvelous set of questions.

David saw mathematics as one of the *humanities* [3], part of human history, concerned with human life, its great importance in human affairs *not* lying in its utility; rather, it was mathematics as an investigative art, offering enjoyment for human beings, that was of over-riding importance for him. This was David's attitude toward any mathematical topic – he was not very interested in only technical results that didn't convey or offer the light of enjoyment and appreciation that can come with them.

David was appreciative and generally receptive of a French writer Michel Serres, who mentioned the moment when Thales in Egypt looked at his own shadow and the shadow of a pyramid. Serres claimed this as a mythic beginning of mathematics – David loved that. [4] I did not hear about this when I was studying philosophy, I remember he asked me about it

The word 'mathematics' derives from the Greek *mathema* and I believe one of its senses is: what has to be taught rather than what could be acquired in the course of plying your trade. You had to *study* to gain this knowledge as a student rather than work as an apprentice or a practitioner (surveyors, bookkeepers, etc.) Practical knowledge was practical in the sense of being used in the course of what they made a living at, and it was passed on in practical situations and not via any learned tradition. He (Thales) recognized that mathematics could be talked about academically.

This was a key for me to an interesting understanding of the complex relation between theory and practice. Personally, I am fascinated by this in connection with the theory of probability – here, it was the practical first, gamblers: once the theory came, the aura of all of the things involved in the practice got lost, got mathematized out of existence

I will end by returning to David's wish for mathematics. He appreciated humor – he did not appreciate a stern mathematics, nor the severe face of mathematicians and I see this as being connected to David's own striking humanity. I thought that he himself was an embodiment of what he insisted mathematics could become, namely one of the humanities.

Frances Hawkins: I had a brother who knew David Wheeler before he and I met. David was a bold young man who just introduced himself to me; it was my brother and my husband who made him available to me.

For a non-mathematician like myself, who was nevertheless very caught up with the education of young children, David had a keen interest in kindergarten–primary age children, those whom I saw as being on the edge of discovering mathematics I used to talk to David whenever I could: he was always interested in such things, in particular the genesis of mathematical knowledge, whether historically or within the individual

I remember telling him of a four-year-old in Kindergarten who came in one day demanding of us, "How many are we?" This small boy looked around the room and saw nothing but questions insistent to be answered. Once this first one had been satisfied, he then moved on to, "How many adults and how many children?" And then, "But how many girls and how many boys?"

This was a child whose mother had said to me, "I don't know why he's asking so many questions" I felt she was very naive, like many adults who can do the routines of

arithmetic yet themselves are not excited about them. This boy was starting to branch off in so many directions, an unfolding and an unleashing of intellectual power; something took root once it had occurred. The last time I saw this boy was as an adult driving along, looking pleased with the world.

I offer this classroom anecdote to help to fill out a picture of David Wheeler, this lovely and remarkable man Not least, I would say that this was true of David too: he was a man who was generally pleased with the world.

Notes (by the editor)

[1] This piece is based on two telephone conversations between the editor and David and Frances Hawkins during the Spring of 2001
[2] This is discussed further on page 4 of David Hawkins' article 'The edge of Platonism', *For the Learning of Mathematics* 5(2), 2-6 The graph itself appears on p 580 of Leibniz' *Sämtliche Schriften und Briefe series VII: Mathematische Schriften. Vol. 1: 1672–1676* (Berlin, Akademie Verlag, 1990)
[3] In 1975, David Wheeler gave an AIM conference plenary address entitled 'Humanising mathematical education', a version of which (under the same title) appeared in *Mathematics Teaching* 71, 4-9. However, although related, the notion of mathematics itself as a humanity is not directly addressed there
[4] David Wheeler wrote about his reading of Serres in this context in: 'Knowledge at the crossroads', *For the Learning of Mathematics* 13(1), 53-54

An Extraordinary Elsewhereman

WILLIAM C. HIGGINSON

One of the annual landmarks of Canadian intellectual life is a series of fall lectures delivered on the national radio network. Named after a former governor general, the Massey lectures present the voices of pre-eminent scholars grappling with interesting and substantial themes in five hour-long lectures. Over the past three decades, listeners have heard from thinkers as diverse as Northrop Frye, George Steiner, Carlos Fuentes, Ursula Franklin and Charles Taylor.

In 1997, the Massey lecturer was Hugh Kenner, a Canadian-born literary critic and long-term resident of the United States. The title of Kenner's lecture series, and his related book, was *The Elsewhere Community*. In his opening talk, Kenner considered the classical 'continental tour'. In his final session, he reflected on the potential social and cultural impact of electronic communication devices. In between these historical limits, there was a lot of autobiographical material. Central to Kenner's theme was the educational impact of travel, of spending time with carefully chosen 'others' in some 'foreign' culture who see the world differently Having sought out and experienced this 'elsewhere community', the traveller, according to Kenner's model, returns to his or her society primed with possibilities for innovation and change.

These were provocative ideas for me. They caused me to think of the extent to which travel – I have lived for extended periods of my life in Africa, Continental Europe, Great Britain and the United States – has formed my way of viewing the world and my consequent approach to life in my native country. The mathematician in me, doubtlessly spurred, at least in part, by exposure to graph theory, moved to an extension of Kenner's definition If we had 'elsewhereperson category 1' – Kenner's original – who does a complete tour from society A to society B and back to society A, then might we not have a 'one-way elsewhereperson', someone who voyages out from his or her homeland but who does not return. These speculations brought me quickly to thoughts about my long-time friend and colleague, David Wheeler. At a subconscious level, he may even have been the archetype for my creation of the second category of elsewhereperson. David had, at age 50, relocated to Canada – first to Québec and then to British Columbia: except for short visits, he never returned to his native England.

I met David more than thirty years ago when I was a student in England, studying initially for a 'Certificate in Education' (a teaching qualification), and then for a Master's degree. I had come to my Cert. Ed. course with a rather unusual background: two years of unqualified teaching in Canada and two years as a teacher/acting headmaster of a secondary boarding school in northern Kenya. With this experience I found many of the formal and informal opportunities available to students much more attractive than did my more conventional peers who were, for the most part, fresh out of undergraduate programs

I was, in particular, quite entranced by the activities of the Association of Teachers of Mathematics. Professional gatherings of mathematics educators in Ontario had been rather stodgy affairs, full of dry lectures, low-level workshops and a heavy commercial presence. The ATM gatherings I began to attend in England were, both in structure and content, a revelation. The meetings had an egalitarian flavour, the intellectual level was bracingly high and themes were dealt with in considerable depth. One came away from these highly participatory gatherings intrigued, stimulated and challenged.

A central figure in this movement was the editor of the association's first-class journal, *Mathematics Teaching*, one D H. Wheeler, at that time a senior lecturer in education at the University of Leicester I was, at first, somewhat intimidated by this large and imposing man with his quick wit and formidable intelligence Before long, however, I came to see the warmth, generosity and sensitivity behind what might be taken as a gruff exterior, and deeply appreciated his kindness to a young, visiting student. We chatted at several meetings and corresponded a bit He encouraged me to submit some of the ideas we had spoken about for publication in *Mathematics Teaching*

Our next contact was some five years later, when I learned to my pleasure that David was moving to Canada to take up a position at Concordia University in Montréal In the meantime, both of us had made major 'elsewhereperson' moves. I had returned to Canada, completed my doctorate and had begun my university teaching career David had left Leicester, moving to New York City to work with Caleb Gattegno as an educational consultant before deciding to go back into the academic world in Canada Over the next twenty-five years, David was, from a Canadian perspective, the best of all possible eleswheremen (Category 2 elsewherepersons