

## Personal Encounters with My Dear Friend: Derek Robinson

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Encouraged by fellow student Gavin Wraith at Cambridge UK, I travelled in the summer of 1961 as an “observer” to a school on theoretical physics<sup>1</sup> held in Herceg Novi, a beautiful city on the Adriatic coast then part of Yugoslavia. While I was too young to attend the school officially, it was serendipity to be present, for in Herceg Novi I met three students from the ETH: Derek, Klaus Hepp, and David Ruelle. Memorable teachers who interacted with everyone included Kurt Symanzik, Tulio Regge, Walter Thirring, Maurice Jacob, and André Martin. I am sure that ebullient Derek got to know them all.

Derek and I overlapped again at the meeting organized by Dick Kadison at Louisiana State University. To everyone’s dismay, the Japanese mathematician Minoru Tomita arrived to announce his astounding insight, now known as modular theory. This marked the 1967 Baton Rouge meeting as one of the most influential mathematical conferences ever held in the US. I am unsure whether anyone understood Tomita’s talk at the time, but Masamichi Takesaki was fascinated by it and spent the next years as a postdoctoral fellow with Kadison in Pennsylvania—working out the details and writing his famous 1970 book<sup>2</sup>. My friend Sergio Doplicher (whom I met when we both were students at the IHES during the 1963-4 special year on mathematical quantum field theory) also came to Baton Rouge. Derek, Sergio, and I spent one day together after the meeting, mostly as tourists in New Orleans, when I took the Polaroid shown in Fig 1:



Figure 1. Derek with Sergio Doplicher, on O’Keefe Avenue, New Orleans, after the 1967 Baton Rouge Conference

In 1979-81 Derek and Ola Bratteli published their monumental two-volume monograph, on *Operator Algebras and Quantum Statistical Mechanics*<sup>3</sup>. Here they give a beautiful derivation of the Tomita-Takesaki theory, along with explaining its importance and relation to other subjects, including its relation to the Kubo-Martin-Schwinger condition for Gibbs expectations and Connes’ classification of factors. And today, Sergio’s student Roberto Longo has become one of the leading experts on modular theory.

I believe that my next encounter with Derek came in 1968, when he visited the ETH Seminar for Theoretical Physics during the summer, in the middle of my ten-week stay there as guest-professor. The

high point of the afternoon at the friendly Hochstrasse 60, Zurich address involved discussion around a table filled with cake and tea, organized by the institute secretary, Fraulein Rosemarie Hintermann. On these occasions Derek held forth with insight and with his infectious humor; as a result, we renewed our friendship.

Derek and Marion moved to Bandol when Derek joined the group of Daniel Kastler. I was fortunate to have a long visit, living in an apartment in Cassis. I had interesting excursions to their home, and enjoyed the terrace, including one evening with Derek's friend Tini Veltman.



Figure 2. Derek and Marion in Bandol

Derek visited Harvard in the period 1972 as my guest, also as the guest of Shelly Glashow and Sidney Coleman. They three had taught together in a school organized by Feza Gursey in Istanbul, and Shelly was a friend with Derek at CERN. It was in Cambridge, Massachusetts that Derek collaborated on his famous "Lieb-Robinson bound," showing finite propagation speed for a class of lattice statistical mechanics models with local Hamiltonians<sup>4</sup>. Their result is fascinating, as it can be regarded as an analog of the finite propagation speed that Glimm and I had just shown for the two-dimensional relativistic quantum fields that we had constructed.



Figure 3. Derek with Elliott Lieb in Canberra

After Derek left Marseilles for Canberra, he made a tremendous effort to help build up mathematical physics in Australia. Derek hosted me twice in Canberra. My first trip “down under” revolved around a January 1982 summer school. Elliott Lieb and I travelled there together, and afterward Derek organized a grand tour around Australia for the two of us. Figure 3 shows Elliott and Derek together in Canberra. During the hospitable time in Canberra, I got to visit Derek, Marion and their two girls frequently.



Figure 4. Derek and his family at his home in Canberra, January 1982

My second visit to Canberra in 1987 followed speaking at the annual meeting of the Australian Mathematical Society. The photos from these nice occasions chronicle the growth of Derek and Marion’s children; the second visit also involved a party organized by Derek along with Rodney Baxter.



Figure 5. Canberra 1987: Derek and his family

A party organized by Rodney Baxter and Derek

Due to Derek’s life on the other side of the world, we did not interact as often as I would have liked. Derek did visit Harvard again, and we had many good discussions. Our early interactions left a special imprint on me, including his humor and the unique timbre of his voice. What sticks in my mind are Derek’s stories of his unconventional friends, his love and penchant for cycling, his opinions about life in France, and the prospects for science in Australia. Sadly, now I only hear Derek in my mind; I miss his vibrant presence dearly.

## References

1. Bruno Jakšić editor, *Lectures on High Energy Physics*, Hercegnovi 1961, (2 volumes) Federal Nuclear Energy Commission of Yugoslavia 1961.
2. Masamichi Takesaki, *Tomita's Theory of Modular Hilbert Algebras and its Applications*, Lecture Notes in Mathematics 128, Springer Verlag, Heidelberg 1970.
3. Ola Bratteli and Derek W. Robinson, *Operator Algebras and Quantum Statistical Mechanics*, (2 volumes), Texts and Monographs in Physics, Springer Verlag Heidelberg 1979, 1981.
4. Elliott H. Lieb and Derek W. Robinson, The Finite Group Velocity of Quantum Spin Systems, *Commun. Math. Phys.* 28 (1972), 251—257.

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