

Preface

As a postgraduate theoretical physics student in the late 1960s and early 1970s, I became involved in left-wing politics as did many others of my generation. I was introduced to David Bohm's *Causality and Chance in Modern Physics* as one of the very few books available which combined Marxist philosophy and physics.¹ There were no references to Marxist works in Bohm's book, perhaps because he was constrained by the dominant Cold War ethos, but it was clearly in the dialectical materialist tradition. I found it extremely interesting but since very few people in left-wing circles had any knowledge of science, and certainly not quantum physics, I had no occasion to discuss it further. I also presumed, mistakenly, that Bohm's "hidden variable", later called "causal interpretation", approach to quantum mechanics had turned out to be a dead end. I did not think I could relate it to my own research. Not unlike today there were few job openings in theoretical physics, so with a young family to support I became a mathematics lecturer in a polytechnic, or a "new" university as they are now called, and concentrated on teaching and directed my research into engineering.

When I retired and was away from the pressure of teaching, administration and finding research funding, I returned to look at Bohm's work. I had read David Peat's colourful biography of Bohm and noted the many references in the period when Bohm was exiled in Brazil to personal letters to Hanna Loewy, Miriam Yevick and Melba Phillips. It seemed possible that these could give some insight into how Bohm had developed his ideas in *Causality and Chance*, so I inquired at Birkbeck College, University of London, library archives to find out what was available. I was delighted to find that there were photocopies of what eventually turned out to be 124 letters written by David Bohm in the first half of the 1950s. Quite a few were incomplete, Bohm's handwriting was often unclear, the photocopies were frequently poor and many were not in date order. Consequently I spent more than two years transcribing and editing the letters which are assembled here.

¹There were English translations of Soviet books, but they were mostly uninspiring "official" publications.

In the meantime I read up on the Bohmian version of quantum mechanics, studying to the best of my ability the growing body of material from the Bohmian mechanics group, Bohm and Hiley's *The Undivided Universe*, James T. Cushing's *Quantum Mechanics*, and so on. I soon realized that I had been mistaken in thinking Bohm's approach to quantum mechanics had got nowhere, his "causal interpretation" was just as valid as the standard "Copenhagen" version of quantum theory taught in universities and deserved much more recognition than it had hitherto received. Reading the letters convinced me that the philosophy set out in "Causality and Chance" was also a major part of Bohm's work in that period, it was difficult to separate from the purely scientific work, and for reasons mainly related to the influence of Stalinism, has been largely ignored.

The letters are difficult to read through, containing a mixture of comments on scientific work, philosophy and politics together with details of personal experiences and problems. I decided the best way to draw out the importance of the letters was to write an introduction with various themes: philosophy, mathematics, the causal interpretation, probability and statistical mechanics, feminism and politics, attempting to explain Bohm's views and how they relate to scattered parts of the letters. I had to update my knowledge of theoretical physics to get to grips with the topics involved, and found I needed to gain a better understanding of Marxist philosophy. What passed for Marxist philosophy in the left-wing circles I had moved in was woefully inadequate, often highly disputative, and demonstrating only a nodding acquaintance with the actual ideas of Marx and Engels. I have taken the view that the theoretical outlook of Marxism, including the work on philosophy by Lenin and then the philosophical debates in the USSR in the 1920s, has an importance in its own right. I think the references I have given back that up. Historical studies, which I also reference, have shown the huge break from the 1920s to the repression that took place under Stalin's "revolution from above" in the 1930s onwards. Although there is still a widespread tendency, cultivated in the Cold War period, to identify Marxism with the Stalin period, it has no basis in historical fact.

In Brazil, Bohm was clearly fully committed to Stalinist politics, so I felt it necessary to try to understand something of the history of the USSR and the nature of Stalinism. Marxist philosophy was suppressed and distorted under Stalin's rule, and science also came under attack, most seriously in genetics with the well-known case of Lysenko but physics only narrowly escaped because of its importance in making an atomic bomb. Therefore I have added a chapter attempting to summarize, with references, what happened to science and philosophy in the USSR from the 1930s onwards. The letters show that Bohm's support for the USSR did not mean he restricted himself to Stalinist philosophical dogma. He had a sufficient knowledge of the Marxist classics to develop his own philosophy, especially in physics where he was at his most original and could base himself on a sound scientific understanding. In my opinion it was the suppression of genuine Marxism in the Soviet Union that contributed to Bohm's isolation in the Brazil period, and explains why *Causality and Chance* did not gain the interest it deserved on either side of the Iron Curtain.

Finally I felt that many readers might feel that I had concentrated on the science, philosophy and politics because these were the areas in which I was interested, at the expense of psychological issues. Therefore in the last chapter I have attempted to explain the huge pressures that Bohm was under in Brazil, and which go some way to explaining the emotional explosions that colour the letters.

I could only put together this book with the help of many people. I interviewed Basil Hiley two years ago and he kindly gave his support for editing the letters. Since then he commented favourably on a draft of my introduction and helped steer through copyright issues regarding the letters at Birkbeck College library. I have had considerable help from Olival Freire Jr. with whom I have corresponded and also met while he was in London. In discussion Olival generously shared his wide knowledge of Bohm's history and helped correct some of my mistakes in an earlier draft. I have also been helped by correspondence with other academics in the Bohmian area, the Finnish philosopher of mind Paavo Pylkkänen and the historian of science José Perillan of Vassar College, New York. Historical information was obtained from academics who remember David Bohm from the 1950s, Mario Bunge of McGill University and Silvan Schweber of Harvard. I must, of course, stress that the interpretation of the letters given in the introduction is entirely my own, as are any mistakes and omissions.

Working in the archives at Birkbeck was made possible by the helpfulness and interest in David Bohm of librarian Sue Godsell, now retired, and the current librarian Emma Illingworth who has maintained support and enthusiasm. Thanks to Huddersfield University for allowing me to continue with email and library access in retirement. I particularly need to thank Gratiela Neçsutu for meticulous proofing of my transcriptions of the letters. My editor Angela Lahee at Springer must be thanked for her interest in Bohm as well as her patience with my slow rate of work.

Finally I must thank my three children for their continued support and interest. I am especially indebted to my wife, Ann, for putting up with hours of discussion exploring the ideas of David Bohm and for her invaluable historical help as I attempted to unravel the complexities of the post-World War II world.

<http://www.springer.com/978-3-319-55491-4>

David Bohm: Causality and Chance, Letters to Three
Women

Talbot, C.

2017, X, 446 p. 25 illus., Hardcover

ISBN: 978-3-319-55491-4