Chapter 3
Bohm After Brazil

After Bohm moved to Israel in 1955, the few letters in the archives (all to Melba Phillips) show a distinctive change. In philosophy, he continued and deepened the study of Hegel he had begun in Brazil, especially under the influence of the Brazilian physicist and Communist Mario Schönberg. Whatever his misgivings about Marxism, however,[1] he went ahead with the publication of *Causality and Chance*.

More and more revelations about what was happening in the Soviet Union became available, which, while in Brazil, Bohm had insisted were only temporary problems, due to the backward conditions, to hostility from the west, and so on. But in Israel, as well as through Kruschev's revelations, he learnt directly about Russia and Eastern Europe from exiles, some of whom were long-standing Communists. The letters show he abandoned his support for Stalinist Communist Party politics, though continuing at that time to hold socialist ideals. Although he met and then married Saral, which put him on a more stable emotional footing, he appears to have gone through a considerable intellectual crisis.

Bohm appears to have spent much of the late 1950s and the 1960s pursuing "holistic" philosophy, studying the philosophy of Hegel[2] and A.N. Whitehead, conducting dialogues with the Indian speaker and writer Jiddu Krishnamurti and with a

[1] In (19, **54**, p. 182), in 1956 he wrote the following to Melba: "I have been studying Hegel (along with some other people here in Israel). It is true that Marx and Engels stood Hegel's ideas on their feet, by making them materialistic. Nevertheless, there was a tremendous wealth of ideas that they did not use, because the science of the time did not require them. But now, with the further development of science, these ideas applied to space, time and matter are surprisingly fruitful, as well as beautiful".

[2] An interesting summary of Bohm's views on Hegel in the 1960s is given by Paul Feyerabend, who discussed with Bohm when they were both at Bristol University (Radner and Winokur 1970), pp. 31–36 and 113–116). Feyerabend is well aware of the connections between Marxism and Hegel and teases the philosopher of science Imre Lakatos for pretending to be a Wittgensteinian and hiding his dialectical training in Hungary (by Georg Lukacs among others).

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research student, Donald Schumacher, on language, exchanging letters with Charles Biederman on art,[3] and so on.[4]

In terms of his work on physics in the 1960s period, he is mostly remembered for work with Yakir Aharonov, his research student in Israel and at Bristol, which led to the proposal of the Bohm-Aharonov effect.[5] But on the causal interpretation, we know from Basil Hiley that "in the first ten years I worked with David Bohm his '52 paper was not discussed at all", the main reason being that "first of all David Bohm was not that interested in it and secondly I didn't believe it."[6] Only when a student insisted that Hiley studied it did he become interested.[7] With the involvement of a number of students—Christopher Philippidis, Christopher Dewdney, Peter Holland, Fabio Frescura and others—Bohm and Hiley renewed work on the causal interpretation.[8] From the early 1970s on, Bohm developed his philosophy of wholeness, which was also featured in a key paper he wrote with Hiley in 1975.[9] In this paper Bohm and Hiley returned to the causal interpretation, highlighting the non-locality or "entanglement" issue referred to above, which had been brought out by John Bell: "the most fundamentally different new feature [of quantum mechanics] of all; i.e., the intimate inter-connection of different systems that are not in spatial contact."[10] This point was made while experiments were still continuing on the issue of Bell's theorem and entanglement, a long struggle documented by Freire[11] and culminating in the experiments of Alain Aspect in 1981–82.[12] Thus, Bohm reinterpreted the 1952 papers in terms of his distinctive ontology of the *Implicate Order*,[13] and worked with Hiley on their ontological interpretation of quantum mechanics in order to eventually produce the ground-breaking textbook *The Undivided Universe*.[14]

The development of Bohm's ideas after the period covered by the letters collected in this book is, of course, a vast subject which I can only touch on here. Bohm seems to have engaged with many different people in areas that seem so disparate that it makes it hard to take in his multi-faceted thinking about the world. For example, with

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[3] Pylkkänen (1999).

[4] See Peat (1996), Chaps. 11–13.

[5] See, for example, Peat (1996), pp. 190–2.

[6] See http://www.bbk.ac.uk/lib/bohm/bibliography-publications-by-david-bohm, which verifies this point. From 1961, after David Bohm met Hiley, there is only one paper in the 1960s on the causal approach, and this is published jointly with de Broglie and de Broglie's former research student and Communist Party activist Jean-Pierre Vigier, who retained their commitment to the 1952 approach.

[7] https://www.youtube.com/watch?v=q_jHmoxuxsY.

[8] Hiley expanded on this to Olival Freire in an interview (Freire Jr. 2015), p. 61 and made the same points to me in an interview, January 25th, 2015.

[9] Bohm and Hiley (1975).

[10] I am indebted to Olival Freire for pointing this out.

[11] Freire Jr. (2015), Chap. 7.

[12] See also Whitaker (2011).

[13] Bohm (1980).

[14] Bohm and Hiley (1993).

David Peat he wrote *Science, Order and Creativity*,[15] which is in line with the view of the infinite possibilities/resources of humankind that he refers to in his letters. It is interesting to read the review of it by Detlef Dürr, one of the "Bohmian Mechanics" group of physicists we shall touch on later[16]:

> Only a few writers would be able to cover such a broad landscape of ideas and themes without condemning themselves to shallowness. Bohm, who was one of the greatest thinkers and physicists of the last century, shows in this discourse with Peat a tremendous depth of understanding which makes the book a helpful resource for all those who have the urge to inquire into human understanding of our physical world, our behavior, and the development of society.

For those interested in the scientific problem of "consciousness", an area which seems to be of growing interest to many physicists, the attempt of Paavo Pylkkänen to understand the implication of Bohm's later views for the philosophy of mind is well worth studying.[17] For "hard" physicists, repelled by Bohm's involvement in "spiritualistic" or "metaphysical" areas, I would recommend a look at the philosophical, psychological and political outpourings of the founding fathers of quantum mechanics, as discussed by historian of science Mara Beller in response to the smugness of many scientists in the so-called "Science Wars" in the 1990s,[18] when Alan Sokal and Jean Bricmont, after getting a "spoof" article published in a social science journal, lambasted the postmodern trends in the humanities.[19]

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[15] Bohm and Peat (2010).

[16] Düerr (2012).

[17] Pylkkänen (2007).

[18] Beller (1998).

[19] Sokal and Bricmont (1998).

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