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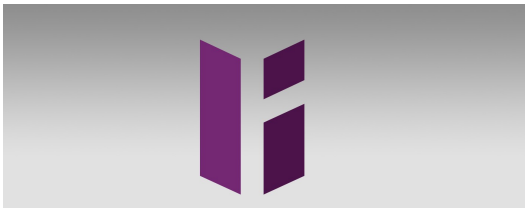

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Abstract

In this paper, I analyse the hitherto largely ignored social and psychological roots of the philosophy of wholeness in David Bohm and Georg Wilhelm Friedrich Hegel. Hegel was Bohm's strongest philosophical influence throughout his mature intellectual life, however, as demonstrated in the paper, Bohm's abhorrence of fragmentation and his affection for wholeness, which is prominently reflected in both his physics and his philosophy of science, was actually the realisation of specific social propensities and psychological determinants of his early emotional and intellectual development for which Hegel's philosophy was a crucial rational catalyst later in his life. These social propensities and psychological determinants of Bohm's early development are further demonstrated to be strikingly similar to those that also led the young Hegel to engage with the concept of wholeness throughout his life. The article also brings the biographical evidence of Bohm's lifelong interest in Hegel and analyses the state of scholarship regarding his Hegelianism, the nature of Hegel's philosophy as reflected in Bohm's work, and the reasons for the somehow unexpected disciplinary neglect of the crucial influence of Hegel's philosophy on Bohm.

Keywords

David Joseph Bohm, George Wilhelm Friedrich Hegel, fragmentation, wholeness, sociocultural milieu, temperament, mysticism, speculative philosophy, imagination

Introduction

The German philosopher George Wilhelm Friedrich Hegel (1770–1831) and the American-born British theoretical physicist David Joseph Bohm (1917–1992) represent two major figures in the history of modern philosophy and physics. Hegel, one of the most important systematic philosophers in the history of Western philosophy and one of the most prominent figures of philosophical idealism, not only reshaped the landscape of nineteenth-century philosophy but also had an immense influence on twentieth-century philosophy and theology in their most diverse subdisciplines, the influence that continues both in the so-called continental and analytic philosophical traditions.[1] Bohm, on the other hand – although his work was never crowned by the Nobel Prize, an honour he certainly deserved if only the so-called Bohm-Aharonov effect was his sole contribution to physics – not only radically reshaped the landscape of twentieth-century physics with his seminal contributions to condensed-matter physics and foundations of quantum mechanics but has continued to inspire and influence new generations of physicists in searching for innovative paths in understanding the nature of the microworld and physics itself.[2] Nevertheless, despite being born, growing up, and living in profoundly different cultures, temporally separated by almost a century and a half, and, most importantly, despite working in the seemingly most remote and disparate

fields, the systems of thoughts Hegel and Bohm developed share one essential common characteristic, namely, a deep sensitivity to fragmentation of society and man and a strong consequent urge for overcoming it through affirming the view of reality as an undivided wholeness. That the concept of wholeness is one of the founding "pillars of Bohm's new approach to the quanta"[3] and "the leitmotif of all Bohm's research"[4] is recognised by Bohmian scholars equally well as Hegel scholars recognise that "the key to understanding [Hegel's] thought is the concept of wholeness".[5]

This similarity between Bohm, a physicist, and Hegel, a philosopher, should not come as a surprise. Already as a young man, Bohm realised that his "fundamental interests were what other people called philosophical" but also that "scientists tended to look down on philosophy as not being very serious", which "created a problem for me, as I was never able to see any inherent separation between science and philosophy".[6] To resolve this problem, at least for himself, Bohm not only matured into a world-class physicist but also into an intellectual who was not afraid to wrestle with both Western and Eastern philosophical traditions to make sense of modern physics, up to the point at which his physical insights became essentially inseparable from the philosophical ones. About these philosophical influences there exists a relatively rich body of research. Thus, for example, we know much about Bohm's early interest in Marxism and its influence on his work in the late 1940s and 1950s,[7] as well as about his later engagement with Jiddu Krishnamurti's ideas and his persona in the 1960s and 1970s.[8] However, although strong and captivating while they lasted – in the case of his Marxism for about fifteen years, and for almost two decades in the case of Krishnamurti – both these influences eventually turned out disappointing for Bohm. As recollected by Basil Hiley, Bohm's former colleague and friend, "it was when he moved on to Hegel that he became excited",[9] and this 'move', according to Hiley, seems to have happened quite early in Bohm's life, even before he became engaged with Marxism in the 1940s. Moreover, as Hiley further testified, Bohm in fact "joined the Communist party, a move that got him into trouble with McCarthy" just "to meet people who he could discuss Hegel with", which however turned out "not such a bright idea", since, as Hiley recalled Bohm's words, "'nobody in the local group had even heard of Hegel'".[10] While such an account of the genesis of Bohm's Hegelianism might be found historically problematic, and thus taken only in logical terms,[11] regardless of the circumstance whether Bohm came into contact with Hegel's philosophy in the 1940s while still in America, or perhaps somewhat later in the 1950s, during his stays in Brazil 1951–1955 and Israel 1955–1957, as will be noted in more detail in Section 3, it nevertheless cannot be disputed that Hegel's philosophy ever since remained a fruitful and stable inspiration for his work.

The purpose of the present article, however, is not to offer a post hoc analysis of Bohm's Hegelianism concerning the concept of wholeness, as the most notable Hegelian characteristic of Bohm's physics and philosophy, which is a work in progress as part of the present author's larger systematic study of Hegelian influences upon Bohm. Instead, in this article, I intend to demonstrate that Bohm's lifelong embrace of the concept, including its Hegelian underpinnings, was the realisation of specific social propensities and psychological determinants of his early intellectual and emotional development present before he encountered Hegel's philosophy in any rational fashion. Moreover, the main premise of this article is that Bohm did not come to the idea of wholeness either through Hegel or physics and philosophy, although

later in his life these were significant cognitive catalysts of the idea, a circumstance that Bohm himself was repeatedly stressing. When thus, for example, he recollected his feeling from the early 1960s that "fragmentation was a key problem", and that this problem "turned my attention towards wholeness", on the interviewer's impression that he "already got that to some extent

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See e.g. Joseph J. O'Malley *et al*. (eds.), *The Legacy of Hegel. Proceedings of the Marquette Hegel Symposium 1970*, M. Nijhoff, The Hague 1973; Paul Giladi, "Hegel, Analytic Philosophy's Pharmakon", *The European Legacy* 22 (2017) 2, pp. 185–198, doi: https://doi.org/10.1080/10848770.2016.1272768 ; Frederick F. Beiser (ed.), *The Cambridge Companion to Hegel and Nineteenth-Century Philosophy*, Cambridge University Press, Cambridge 2008.

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See, e.g., Basil J. Hiley, "David Joseph Bohm. 20 December 1917–27 October 1992", *Biographical Memoirs of Fellows of the Royal Society* 43 (1997), pp. 106–131, doi: https://doi.org/10.1098/rsbm.1997.0007; Xavier Oriolis, Jordi Mompart, *Applied Bohmian Mechanics. From Nanoscale Systems to Cosmology*, Pan Stanford Publishing, Singapore 2012; Boris Kožnjak, "The missing history of Bohm's hidden variables theory. The Ninth Symposium of the Colston Research Society, Bristol, 1957", *Studies in History and Philosophy of Science Part B. Studies in History and Philosophy of Modern Physics* 62 (2018), pp. 85–97, doi: https://doi.org/10.1016/j.shpsb.2017.06.003; Olival Freire Jr., *David Bohm. A Life Dedicated to Understanding the Quantum World*, Springer Nature, Cham 2019, pp. 205–240.

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O. Freire Jr., *David Bohm*, p. 120.

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David Peat, *The Infinite Potential. The Life and Times of David Bohm*, Basic Books, New York 1997, p. 197.

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Glenn A. Magee, *The Hegel Dictionary*, Continuum International Publishing, London – New York 2010, p. 1.

6

David Bohm, David Peat, *Science, Order, and Creativity*, Bantam Books, Toronto – New York 1987, p. 3.

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See, e.g., Kishore Kumar Theckedath, "Marxism and quantum mechanics", *Social Scientist* 3 (1974) 1, pp. 34–45, doi: https://doi.org/10.2307/3516141; Thiagarajan Jayaraman, "Marxism and quantum mechanics", *Social Scientist* 3 (1975) 11, pp. 65–72, doi: https://doi.org/10.2307/3516236; Kishore Kumar Theckedath, "Marxism and quantum mechanics", *Social Scientist* 5 (1976) 1, pp. 74–80, doi: https://doi.org/10.2307/3516604; Andrew Cross, "The crisis in physics. Dialectical materialism and quantumtheory", *Social Studies of Science* 21 (1991) 4, pp. 735–759, doi: https://doi.org/10.1177/030631291021004005; D. Peat, *The Infinite Potential*, pp. 57–59, 66–67, 110–111; Russell Olwell, "Physical isolation and marginalization in physics: David Bohm's Cold War exile", *Isis* 90 (1999) 4, pp. 738–756, doi: https://doi.org/10.1086/384509; Alexei Kojevnikov, "David Bohm and collective movement", *Historical Studies in the Physical and Biological Sciences* 33 (2002) 1, pp. 161–192, doi: https://doi.org/10.1525/hsps.2002.33.1.161; Olival Freire Jr., "Science and exile: David Bohm, the hot times of the Cold War, and his struggle for a new interpretation of quantum mechanics", *Historical Studies on the Physical and Biological Sciences* 36 (2005) 1, pp. 1–34, doi: https://doi.org/10.1525/hsps.2005.36.1.1; Anja Skaar Jacobsen, "Leon Rosenfeld's Marxist defense of complementarity", *Historical Studies in the Physical and Biological Sciences – Supplement* 37 (2007), pp. 3–34, doi: https://doi.org/10.1525/hsps.2007.37.s.3; Christian Forstner, "The early history of David Bohm's quantum mechanics through the perspective of Ludwig Fleck's thought-collectives", *Minerva* 46 (2008), pp. 215–229, doi: https://doi.org/10.1007/s11024-008-9090-2; Chris Talbot, "Introduction", in: Chris Talbot (ed.), *David Bohm. Causality and Chance, Letters to Three Women*, Springer, Cham 2017, pp. 3–4; O. Freire Jr., *David Bohm*, pp. 98–99, 105–107, 121–126.

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D. Peat, *The Infinite Potential*, pp. 199–200, 226–231, 284–285, 323–330; David E. Moody, *An Uncommon Collaboration. David Bohm and J. Krishnamurti*, Alpha Centauri Press, Ojai, California 2017; O. Freire Jr., *David Bohm*, pp. 127–132, 174–177.

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B. J. Hiley, "David Joseph Bohm", p. 109.

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Basil Hiley, e-mail to the author, 11 December 2020.

from Hegel" Bohm agreed but also importantly added that "even before that, I had always been interested that way", having seen Hegel as merely "sort of [giving] an extra energy in that direction".[12] Or, when in the introduction to *Wholeness and the Implicate Order* Bohm emphasised that "in my scientific and philosophical work, my main concern has been with understanding the nature of reality in general and of consciousness in particular as a coherent whole, which is never static or complete, but which is in an unending process of movement and unfoldment", he also readily added that "when I look back, I see that even as a child I was fascinated by the puzzle, indeed the mystery" of movement as "an unbroken, undivided process of flow".[13] As I further demonstrate, these social propensities and psychological determinants of Bohm's early development were of a strikingly similar kind to those that also led the young Hegel to his lifelong embrace of the concept of wholeness.

To demonstrate these thus far largely ignored social and psychological roots of the philosophy of wholeness in Bohm and Hegel, which I believe might be of interest to both Bohmian and Hegelian scholars, in Section 2 I first offer an outline of Bohm's lifelong embrace of the notion of wholeness both as a physical concept and a wider worldview outlook, in Section 3 an overall glance of evidence of Bohm's long-lasting interest in Hegel and the state of scholarship regarding his Hegelianism, and then in Section 4 some hints regarding the reasons for the somehow surprising neglect of the influence of Hegel's philosophy upon Bohm among contemporary Bohmian scholars. In Section 5 I then offer some general disciplinary and methodological remarks about the sociology and psychology of philosophical and scientific knowledge, as a preparatory ground for a concrete comparative analysis of those common characteristics of the social contexts of Bohm's and Hegel's early developments that shaped their shared negative receptivity to the phenomenon of fragmentation and a strong consequent urge for overcoming it through affirming the sense of wholeness (Section 6), and a complementing comparative analysis of the common psychological determinants of Hegel's and Bohm's early intellectual developments that turned out pivotal in transforming their intuitive abhorrence of fragmentation and affection for wholeness into a rational system (Section 7). The concluding Section 8 briefly reiterates and summarises the main arguments of the paper by putting them into a wider context of what I believe to be Bohm's most general receptivity of a Hegelian worldview. Understandably, the article does not intend to be either an introduction to or a critical assessment of Hegel's philosophy and Bohm's physics and philosophy of physics, both of which have been studied extensively by numerous Hegelian and Bohmian scholars, except to the extent required for understanding the motivation and intention of the offered comparative analysis of the social and psychological backgrounds of the philosophies of wholeness prominently held by these two major figures in the histories of philosophy and science.

Bohm and Wholeness: an Outline of the Path

The idea of wholeness permeates Bohm's whole work, from his first book *Quantum Theory* (1951),[14] through the central *Wholeness and the Implicate Order* (1980) up to his last, posthumously published book *The Undivided Universe* (1993),[15] just to mention his most known published works, omitting what would be a long list of other books, articles, talks, and interviews

in which Bohm elaborated the idea in great detail. Of course, during more than four decades of his prolific career, Bohm reformulated the idea in various forms but its core content remained the same as when he first rationally articulated it in the late 1940s while being "one of the ablest young theoretical physicists"[16] who already not only significantly contributed to technical matters of plasma physics, quantum electrodynamics, and superconductivity, but also to the understanding of the most fundamental questions of physics, especially quantum mechanics, a theory that brought about revolutionary changes in the way we see the world in contrast to traditional, Newtonian physics. As Bohm put in the *Quantum Theory*, written as a textbook in quantum mechanics for his postgraduate students at Princeton, one of these most fundamental changes, besides the replacement of the notions of causality and continuity held to be universally valid in classical physics with indeterministic and discontinuous descriptions in the microworld, was just the replacement of the assumption that "the world can correctly be analyzed into distinct parts each having a separate existence, but working together according to exact causal laws to form the whole" by the idea that "the world acts more like a single indivisible unit, in which even the 'intrinsic' nature of each part (wave or particle) depends to some degree on its relationship to its surroundings".[17] This was for the young Bohm a clear consequence of the 'essential wholeness of quantum phenomena', a key doctrine of at the time the 'orthodox' or Copenhagen interpretation of quantum mechanics fathered by Niels Bohr,[18] according to which quantum properties of matter (like wave or particle) inseparably depend on the whole of the experimental set-up and are thus essentially relational and contextual.[19] This was wholeness only in a limited sense

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In contrast to Hiley's rather confident recollection, Bohmian scholars have so far found no evidence of Bohm's interest in Hegel's work either before or during his participation in the American Communist Party in Berkeley around 1942 (Olival Freire Jr., e-mail to the author, 6 June 2021).

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Interview of David Bohm by Maurice Wilkins on 3 April 1987, Niels Bohr Library and Archives, *American Institute of Physics*. Available at: https://www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-11 (accessed on 31 July 2022).

13
David Bohm, *Wholeness and the Implicate Order*, Routledge, London 1980, p. x.

14
David Bohm, *Quantum Theory*, Prentice-Hall, New York 1951.

15
David Bohm, Basil Hiley, *The Undivided Universe. An Ontological Interpretation of Quantum Theory*, Routledge, London – New York 1993.

16
According to the October 1946 recommendation of the chairman of Princeton's Physics Department Henry DeWolf Smyth to Princeton president Harold Dodds (see: R. Olwell, "Physical isolation and marginalization in physics", p. 742).

17
D. Bohm, *Quantum Theory*, p. iv. See also p. 144.

18
There is a vast amount of literature on the Copenhagen interpretation and Niels Bohr's philosophy of physics in general, but for both a historical and contemporary critical evaluation, see: Jan Fayer, Henry J. Folse (eds.), *Niels Bohr and the Philosophy of Physics. Twenty-First-Century Perspectives*, Bloomsbury, London – New York 2017.

19
For Bohr's notion of *wholeness of quantum phenomena* and its further development, including Bohm's, see: Boris Kožnjak, "Aristotle and Quantum Mechanics. Potentiality and Actuality, Spontaneous Events and Final Cause", *Journal for General Philosophy of Science* 51 (2020), pp. 459–480, esp. pp. 469–471, doi: https://doi.org/10.1007/s10838-020-09500-y.

of a quantum entity and its experimental 'environment' forming an indivisible whole, but for Bohm it was also an indication that quantum wholeness might greatly surpass the domain of experimental holism and interweave into the very fabric of reality, leading us to generally "picture the world as an indivisible whole".[20] Moreover, a search for this 'new kind of wholeness' became Bohm's lifelong program, even though he soon – within a year after the publication of *Quantum Theory* aimed at understanding quantum mechanics from Bohr's point of view – dissented from the Copenhagen orthodoxy and set out on his heterodox odyssey.

Bohm's work on the 'hidden variables theory' or the 'causal interpretation of quantum mechanics, which he started in 1952 and continued with variable motivation and intensity in the 1960s and 1970s,[21] was on the one hand indeed a radical departure from the Bohrian orthodoxy. The experimental holism of the Bohrian kind, although greatly stimulating for Bohm's passion toward the concept of wholeness, has at the same time dispensed with the notion of independent actuality, implying moreover the principal impossibility of ascribing "an independent reality in the ordinary physical sense" either "to the [quantum] phenomena or to the agencies of observation".[22] Dissatisfied with such an ontological restriction in Bohr's thought, in his alternative to the orthodox interpretation, Bohm thus proposed a picture of the quantum world consisting of actual particles but acted upon not only by the classical potentials but also by the so-called quantum potential determined by a new kind of wave satisfying the standard Schrödinger's equation and being 'responsible' for quantum effects. On the other hand, however, Bohm's alternative account did not dispense with the concept of 'wholeness of quantum phenomena', quite the contrary. Not only did the quantum wave Bohm introduced offered an intuitive explanation of the very experimental holism, having the property of always accompanying the actual particle and thus 'guiding' its behaviour by 'sensing' its experimental environment, but it also turned out that the associated quantum potential has some curious properties, the implications of which greatly surpass the experimental domain and indeed lead to the "radically new notion of unbroken wholeness of the entire universe".[23]

In particular, as Bohm was soon to realise, unlike classical fields and potentials – gravitational, electromagnetic, etc. – the newly introduced quantum potential does not depend on the intensity of the wave associated with the particle but only on its form, and most surprisingly it does not diminish with distance, so even in the case of one particle, the accompanied quantum wave can in principle 'reflect' more than the particle's immediate experimental environment. Such a nonlocal feature of the quantum potential, Bohm believed, radically widens the orthodox concept of the 'wholeness of quantum phenomena', as he found especially evident in the case of the many-particle system. Since the quantum potential is now a function of the positions of all the particles of the many-particle system that also does not fall off with distance, this implies that nonlocal connections should persist between particles of the system that are far distant from each other, even at the cosmic scale. Moreover, as it also turned out, the form of these connections depends in an irreducible way on the quantum state of the many-particle system as a whole and not on the state of its parts, so unlike in classical physics, where parts constitute and determine the whole, which is then, in turn, merely the sum total of its parts, in Bohm's hidden variables theory "the whole has an independent and prior significance, such that, indeed, the whole may be said to organize

the parts".[24] Consequently, Bohm's work on the hidden variables theory not only strengthened his early conviction that wholeness is one of the essential features of the quantum world but also his hope that it is a kind of wholeness "closer to the organized unity of a living being than it is to that obtained by putting together the parts of a machine",[25] where this 'organized unity' – since the whole Universe might be considered one unique many-particle system – transgresses the mere experimental holism and applies to the "unbroken wholeness of the totality of the universe" or "the totality of existence".[26]

Bohm's subsequent work, which was inspired by his 1960s correspondence with the American artist Charles Biederman who shared Bohm's newly discovered concerns about the necessity of finding a 'new notion of order' appropriate to accommodate the notion of wholeness,[27] and which resulted in a series of 1970s papers[28] and finally his 1980 book *Wholeness and the Implicate Order,* added yet another level of arguments for "the unbroken wholeness of the totality of existence" but now in the direction of "an undivided flowing movement without borders".[29] In this new picture, instead of deriving wholeness as an emergent property of the all-pervading inter-connectedness between discrete parts of the whole, Bohm now took wholeness as one of the fundamental properties of the basic underlying reality, and the inter-connectedness between parts of the whole as derived. However, this new 'basic reality' was no more a manifest reality of discrete objects, and forms – our usual 'explicate' or 'unfolded' order – but the 'implicate' or 'enfolded' order that is carried by the 'holomovement', as he termed "the totality of movement of enfoldment and unfoldment".[30]

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D. Bohm, *Quantum Theory*, p. 145.

21
David Bohm, "A suggested interpretation of the quantum theory in terms of hidden variables - I", *Physical Review* 85 (1952) 2, pp. 166–179, doi: https://doi.org/10.1103/physrev.85.166; David Bohm, "A suggested interpretation of the quantum theory in terms of hidden variables – II", *Physical Review* 85 (1952) 2, pp. 180–193, doi: https://doi.org/10.1103/physrev.85.180.

22
Niels Bohr, "The Quantum Postulate and the Recent Development of Atomic Theory", *Nature* 121 (1928), no. 3050, pp. 580–590, here p. 580, doi: https://doi.org/10.1038/121580a0.

23
David Bohm, Basil Hiley, "Intuitive understanding of nonlocality as implied by quantum theory", *Foundations of Physics* 5 (1975) 1, pp. 93–109, here p. 93, doi: https://doi.org/10.1007/bf01100319.

24
David Bohm, "Hidden Variables and the Implicate Order", *Zygon* 20 (1985) 2, pp. 111–124, here p. 115, doi: https://doi.org/10.1111/j.1467-9744.1985.tb00586.x.

25
Ibid.

26
D. Bohm, B. Hiley, "Intuitive understanding of nonlocality as implied by quantum theory", p. 105.

27
See: Paavo Pylkkänen (ed.), *Bohm-Biederman Correspondence. Volume 1: Creativity and Science*, Routledge, London – New York 1999.

28
David Bohm, "Quantum theory as an indication of a new order in physics. Part A. The development of new order as shown through the history of physics", *Foundations of Physics* 1 (1971) 4, pp. 359–381, doi: https://doi.org/10.1007/bf00708585; David Bohm, "Quantum theory as an indication of a new order in physics. Part B. Implicate and explicate order in physical law", *Foundations of Physics* 3 (1973) 2, pp. 139–168, doi: https://doi.org/10.1007/bf00708436.

29
D. Bohm, *Wholeness and the Implicate Order*, p. 172.

30
Ibid., p. 226.

Since Bohm considered the implicate order beyond the grasp of common language, except perhaps for the mathematical one, which Bohm tried to provide, he referred to it mainly in metaphors, and one of his favourites was that of the flowing stream of water. While on the surface of the stream we notice many distinct patterns of vortices that seem relatively independent, stable, and autonomous (its explicate order), in reality, there is "nothing but a flowing pattern of water" in which each vortex is just a form in the movement of the stream as a whole (its 'implicate order') and is thus only "abstracted by the mind from the whole in perception and in thought". [31] By analogy, for Bohm,

"… all matter can be seen to describe just such a movement […] in which there is continued enfoldment of the whole into each region, along with unfoldment of each region into the whole."[32]

In his last published work *The Undivided Universe* – a great synthesis of his life's work – Bohm tried to reconcile these ideas with his earlier work on hidden variables and the quantum potential, especially trying to give them as precise mathematical form as possible, the details of which transcends the scope of this paper, but the idea of wholeness remained his main motivation as strong as it was throughout his career.

During all these decades of his intense work on the restoration of the concept of wholeness in the world of physics, Bohm also passionately argued for the need of restoring the concept of wholeness in other areas of science, particularly biology and psychology, which, as he believed, reduced humanity to a mere collection of non-related individuals and human beings themselves to a mere collection of cells, tissues, and organs.[33] For Bohm, however, the stakes were much higher than a recovery of the lost unity of science, which "sought originally to give man a wholeness of knowledge and understanding", since "the problem is not one that can be restricted to science".[34] In particular, Bohm saw "all these features of current scientific activity [as] manifestations of a general social condition: *fragmentation*", which "shows itself in nation arrayed against nation, race against race, religion against religion, group against group, and man against man".[35] Furthermore, Bohm regarded that "over the ages, in the psychological, communal, and spiritual spheres, there has been a serious and sustained breakdown of wholeness", which has typically taken "the form of widespread fragmentation between nations, races, religions, ideologies, and so on, going on down to smaller groups, including the family", with "even the individual [being] fragmented".[36] The fragmentation in science was thus for Bohm only a symptom of a much larger phenomenon, and in this light, he saw science as only "partaking of the general conditions of fragmentation", which has throughout history "produced severe and destructive conflict on every level".[37] At the same time, however, Bohm deeply believed that this is an unnatural state, and that "man has always been seeking wholeness – mental, physical, social, individual",[38] which should be evident already at the etymological level:

"It is instructive to consider that the word 'health' in English is based on an Anglo-Saxon word 'hale' meaning 'whole': that is, to be healthy is to be whole, which is, I think, roughly the equivalent of the Hebrew 'shalem'. Likewise, the English 'holy' is based on the same root as 'whole'. All of this indicates that man has sensed always that wholeness or integrity is an absolute necessity to make life worth living. Yet, over the ages, he has generally lived in fragmentation."[39]

Revolution brought by quantum mechanics through reestablishing the notion of wholeness was for Bohm thus only an opportunity to reestablish not only the unity of nature and knowledge but also of both man and society, a program

that, as I intend to demonstrate in detail in this article, he passionately shared with Hegel.

Bohm and his Hegelian Passion

As seen in the preceding section, the concept of wholeness was for Bohm much more than a mere physical concept. Although he was primarily developing it inspired by the revolutionary changes brought about by quantum theory, in his writings the idea of wholeness largely transgressed the world of physics and science in general, becoming the founding building block of a specific worldview that encompasses the unity of knowledge, man, society, and the world. Moreover, not only that Bohm argued for a 'postmodern physics' (an unpopular term that got him into trouble; but see the next section) that should "begin with the whole", in contrast to modern physics that "has tried to understand the whole reductively by beginning with the most elementary parts", but he also argued that such a new physics "should not separate matter and consciousness and should therefore not separate facts, meaning, and value", as well as that science generally should be then "inseparable from a kind of intrinsic morality", with "truth and virtue" not being "kept apart as they currently are in science".[40]

In particular, led by his work on the implicate order, Bohm believed that since "we are enfolded inseparably in the world, with no ultimate division between matter and consciousness", because of which "*meaning and value are as much integral aspects of the world as they are of us*", it is a "mistake to think that the world has a totally defined existence separate from our own and that there is merely an external 'interaction' between us and the world".[41] In the final instance, Bohm regarded that "we are not complete without the world

31
David Bohm, "The implicate order. A new approach to reality", in: Donald Factor (ed.), *Unfolding Meaning. A Weekend of Dialogue with David Bohm*, Routledge, London 1985, pp. 1–18, here p. 5.

32
Ibid., p. 12. See also: D. Bohm, *Wholeness and the Implicate Order*, pp. 12–14, 61–62.

33
See, e.g. David Bohm, "Some remarks on the Notion of Order" (pp. 18–40), and "Further Remarks on Order" (pp. 41–60), in: Conrad Hal Waddington (ed.), *Towards a Theoretical Biology 2*, Edinburgh University Press, Edinburgh 1969; David Bohm, "A New Theory of the Relationship of Mind and Matter", *Philosophical Psychology* 3 (1990) 2–3, pp. 271–286, doi: https://doi.org/10.1080/09515089008573004.

34
David Bohm, "Fragmentation in science and in society", *The Science Teacher* 38 (1971), pp. 10–15, here pp. 10, 12.

35
Ibid., p. 10.

36
David Bohm, "Fragmentation and wholeness in religion and in science", *Zygon* 20 (1985) 2, pp. 125–133, here p. 126, doi: https://doi.org/10.1111/j.1467-9744.1985.tb00587.x.

37
Ibid.

38
D. Bohm, *Wholeness and the Implicate Order*, p. 3.

39
Ibid., pp. 3–4.

40
David Bohm, "Postmodern science and a postmodern world", in: David Ray Griffin (ed.), *The reenchantment of science. Postmodern proposals*, State University of New York Press, Albany 1988, pp. 57–68, here p. 66.

41
Ibid., p. 68.

which is enfolded in us" just as "the world is not complete without us who are enfolded in it", and that in this light we should not be surprised that

"… if we approach the world through enfolding its wholeness in our consciousness […] the world, which enfolds our own being within itself, will respond in a corresponding way."[42]

All this is certainly suggestively reminiscent of Hegel, who was, as noticed by a Bohmian scholar, "the last great philosophical figure in the West" before Bohm "to attempt a reconciliation between these divisions […] from the premise that reality is one and indivisible, both cosmos and consciousness", and a "holistic thinker" for whom "the single fabric behind all being is an abstract and undefinable principle (*Geist*) that manifests itself as both subject and substance, man and nature, inner and outer truth", and for whom accordingly philosophy

"… consists in grasping the essence of all these domains, which are the signature of the universe, as it were, a universe becoming transparent to itself through the consciousness and self-consciousness of man, the knower."[43]

However, is there any evidence that Bohm was inspired by Hegel?

On the one hand, despite the circumstance that the idea of wholeness is the basic philosophical ingredient Bohm suggestively shares with Hegel, and despite general similarities between the ideas of the two thinkers, nowhere in his published works – both technical and nontechnical – did Bohm ever mention Hegel as a source of inspiration. This, however, was not to hide his major philosophical influence, since, on the other hand, Bohm acknowledged the decisive influence of Hegel upon him in his numerous interviews and recollections. Thus, for example, in his twelve-session interviews with Maurice Wilkins, conducted from June 1986 to April 1987 for the Oral Histories of the American Institute of Physics, Bohm explicitly mentioned Hegel and its philosophy 148 times, to which we should also add numerous implicit mentions of Hegel's philosophy.[44] Compared to this, Krishnamurti is mentioned 89 times, and Marx and Marxism 63 times. In his dialogical interview with Sean Kelly at Birkbeck College, London, in February 1987, Bohm also extensively referred to Hegel,[45] as well as in his other interviews and conversations.[46] In all these interviews, Bohm does not merely mention Hegel and his philosophy in some general historical context, but explicitly as related to his physics and philosophy of physics, testifying over and over again that throughout his life he spent a considerable amount of time and energy studying Hegel's philosophy.

There is also an abundance of anecdotal material regarding Bohm's passion for Hegel's philosophy. While on vacation in Holland in the summer of 1955, Bohm was visited by the physicist George Yevick, who came from the United States to discuss physics but remained deeply disappointed, since "all he ever heard about was Hegel, Hegel, Hegel".[47] During his years in Israel 1955–1957, Bohm constantly read and reread Hegel's *Logic*, a fact that could not pass unnoticed by his wife Saral, who kept him teasing "Why are you reading that book again – haven't you finished it yet?",[48] and in the decades to come, "he always packed a copy of the *Logic* whenever he travelled".[49] Paul Feyerabend, Bohm's colleague at the Bristol University in 1957–1958, also testified that "at that time he either read Hegel's logic or had just read it".[50] According to Basil Hiley, Bohm's closest associate from the 1960s until his death, "the stories I hear from people who knew him were that he was very into Hegel", and that "he used to walk around the campus […] with Hegel under this arm,

and always looking at it".[51] Moreover, according to Hiley, "Mrs. Bohm told me that not long before he died he was sitting in his armchair at home reading Hegel again, and she said to him, 'David, don't you know everything about Hegel by now'".[52] Therefore, as further put by Hiley, there could be no doubt that Bohm was "very influenced by Hegel's work", and that Hegel "had a very deep influence in him", though Bohm "never quoted Hegel". [53]

To be sure, the influence of Hegel's philosophy upon Bohm has been regularly cited in historical, philosophical, and biographical analyses of Bohm's life and work. Already in a 1960 review of Bohm's 1957 book *Causality and Chance*,[54] Paul Feyerabend, with whom Bohm extensively discussed philosophical matters of modern physics in Bristol, noticed a Hegelian flavour of Bohm's ideas,[55] which Feyerabend will reiterate in his 1970 essay "Against Method" preceding his more famous book of the same title when referring to Bohm's contribution to the symposium on the history of science 'Scientific Change' held at the Oxford University in July 1961. Here, for Feyerabend, a similarity between Bohm and Hegel "is no accident", since "Bohm has studied Hegel in detail, and has taken the *Logic* especially as the point of departure for some of his scientific views".[56] In the most recent and certainly the most comprehensive Bohm's biography to date, Olival Freire Jr. gives detailed

42
Ibid.

43
Renée Weber, "Reflections on David Bohm's holomovement. A physicist's model of cosmos and consciousness", in: Ronald S. Valle, Rolf Von Eckartsberg (eds.), *The metaphors of consciousness*, Plenum Press, New York 1981, pp. 121–140, here p. 124.

44
Interviews of David Bohm by Maurice Wilkins, Niels Bohr Library and Archives, *American Institute of Physics*. All sessions available at www.aip.org/history-programs/niels-bohr-library/oral-histories (accessed on 31 July 2022).

45
David Bohm, Sean M. Kelly, "Dialogue on Science, Society, and the Generative Order", *Zygon* 25 (1990) 4, pp. 449–467, doi: https://doi.org/10.1111/j.1467-9744.1990.tb01120.x.

46
See, e.g., William M. Angelos' interview with David Bohm, "'Beyond Limits': A Conversation with Professor David Bohm", recorded by Dutch Television in September 1990. Full transcript and video of the interview is available at the Bohm-Krishnamurti Project website at https://bohmkrishnamurti.com/beyond-limits/ (accessed on 31 July 2022).

47
Interview of George Yevick by David Peat, 30 April 1993, in: D. Peat, *The Infinite Potential*, p. 167.

48
Interview of Saral Bohm by David Peat, May 1993, in: D. Peat, *The Infinite Potential*, p. 180.

49
Ibid., p. 156.

50
Letter of Paul Feyerabend to David Peat, 9 July 1993. I own a copy of this letter to Chris Talbot.

51
Interview of Basil Hiley by Olival Freire on 11 January 2008, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/33822 (accessed on 31 July 2022).

52
Ibid.

53
Ibid.

54
David Bohm, *Causality and Chance in Modern Physics*, Routledge and Kegan Paul, London 1957.

55
Paul K. Feyerabend, "Professor Bohm's philosophy of nature", *The British Journal for the Philosophy of Science* 10 (1960), pp. 321–338; see esp. pp. 331 and 335, doi: https://doi.org/10.1093/bjps/x.40.321.

56
Paul K. Feyerabend, "Against Method. Outline of an Anarchistic Theory of Knowledge", in:

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insights into Bohm's Hegelian influences through Marxist intellectuals during his stays in Brazil 1951–1955 and in Israel 1955–1957,[57] the Brazilian physicist Mario Schönberg – "one of the few Marxists who took seriously Lenin's advice that they should read Hegel",[58] and the Israeli philosopher Meshulam Groll – a "Marxist who got very interested in Hegel" and "had studied Hegel thoroughly", and who taught Bohm that although "Marx and Engels stood Hegel's ideas on their feet, by making them materialistic" there nevertheless "was a tremendous wealth of ideas that they did not use, because the science of the time did not require them".[59] These Marxist-Hegelian influences upon Bohm during his years in Brazil and Israel are also mentioned and analysed in Chris Talbot's recent critical editions of Bohm's letters in the periods 1950–1956 and 1966–1969,[60] as well as earlier in David Peat's biography of Bohm.[61] Nevertheless, while Bohm's Hegelian 'upgrade' of his Marxism as reflected in his 1957 book *Causality and Chance* has been extensively studied, no systematic attempts exist thus far to analyse Bohm's Hegelianism and its place in the general development of his thought, an exemplar of this being Paavo Pylkkanen's relatively recent book *Mind, Matter, and the Implicate Order*, which aimed at a systematic reconstruction of Bohm's philosophical influences and reflections, but in which Hegel is not even mentioned.[62]

Such neglect, however, does not do justice to Bohm's Hegelian passion that completely overwhelmed his whole life and work. By the 'Hegelian passion', it is here not meant a mere imitation of Hegel, not even a sheer application of Hegel's ideas by Bohm but 'passion' in the authentic Hegelian fashion. Namely, as put by Hegel, without passion "*nothing great in the World has been accomplished*",[63] and Bohm's life and work did not lack in such a passion. As the thirty-five-year-old Bohm wrote, "I have what you might call a passionate desire to fight this stupefying spirit of formalism, and pragmatism in physics", to which "only results count", while "the ideas behind them are just 'window-dressing'".[64] However, as Hegel would further add, an authentic 'passion' transcends a mere individual self-interest motivation,[65] at least in certain world-historical individuals (*welthistorische Individuen*),[66] who succeeded in overcoming the particular self of their passion and employed it for the cause of reason and history by enfolding the universal. Bohm's passion was thus Hegelian not only in the sense of his lifelong interest in Hegel's philosophy as an inspiration for his physics and philosophy of physics, which he investigated with "fearlessness and passion of the intelligence"[67] but also in the sense that his life and work quite generally were also of a genuinely realised world-historical individual "totally engaged in the calm but passionate search into the nature of things".[68] Unexpected as it might seem, however, the mentioned neglect of, or at least the ambivalence toward Bohm's Hegelian passion – both in content and temperament – seems to have had certain wider cultural and even ideological reasons, as I shall demonstrate in the next section.

Bohm's Hegelian "Mysticism" and its Discontent

When in the twentieth century the philosophy of science has started its life as an independent academic discipline, it was greatly influenced by Anglo-American analytic philosophy that started its own life just as a fierce reaction to neo-Hegelianism, most prominently voiced by British philosophers like Bertrand Russell and G. E. Moore, who considered Hegel as an obscurant and

irrelevant charlatan "much attracted to mysticism".[69] Accordingly, the view that "as a possible source for ideas about the philosophy of science, Hegel might seem like an unlikely prospect"[70] was widely spread among the early philosophers of science, the majority of whom were greatly influenced by the spirit of analytic philosophy. Such an attitude can be vividly illustrated by a reaction to Bohm's Hegelianism coming from the Argentinian physicist and philosopher of science Mario Bunge, who in 1953 spent half a year with Bohm in São Paulo as a postdoctoral fellow, and whom Bohm shortly visited in Argentina in 1955. As Bunge recollected their encounters, he did not hide his displeasure with Bohm's interest in Hegel, and he even complained to Bohm about why is he "wasting his time reading that garbage", to which Bohm simply responded that Hegel inspired him. For Bunge, who put great efforts into debunking what he termed 'academic charlatanism',[71] consisting

Michael Radner, Stephen Winokur (eds.), *Analyses of theories and methods of physics and psychology. Minnesota studies in the philosophy of science, Volume 4*, University of Minnesota Press, Minneapolis 1970, pp. 17–129, here p. 114.

57
O. Freire Jr., *David Bohm*, pp. 38, 89, 91, 108, 122, 132, 153, 196.

58
Interview of David Bohm by Maurice Wilkins on 27 February 1987, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-9 (accessed on 31 July 2022).

59
Bohm's letter to Miriam Yevick, 9 January 1952 [possibly 1953], in: C. Talbot, *David Bohm*, p. 308.

60
C. Talbot, *David Bohm*, pp. 9, 26, 32, 42; See also: Chris Talbot, *David Bohm's Critique of Modern Physics. Letters to Jeffrey Bub, 1966–1969*, Springer, Cham 2020, pp. 9–11.

61
D. Peat, *The Infinite Potential*, pp. 155–157, 179–181.

62
Paavo Pylkkänen, *Mind, Matter and the Implicate Order*, Springer, Berlin – New York 2007.

63
Georg Wilhelm Friedrich Hegel, *Lectures on the Philosophy of History*, transl. J. Sibree, G. Bell and Sons, London 1914, p. 24; emphasis in the original.

64
A letter to Miriam Yevick, 9 January 1952 [possibly 1953], in: C. Talbot, *David Bohm*, p. 308.

65
For Hegel's understanding of *passion* (*Leidenschaft*) see, e.g., Andreja Novakovic, "Hegel on Passion in History", *Internationales Jahrbuch des Deutschen Idealismus. Psychologie* 15 (2019), pp. 143–166.

66
See "Introduction" in G. W. F. Hegel, *Lectures on the Philosophy of History*, esp. pp. 30–32.

67
Basil J. Hiley, F. David Peat, "General introduction: The development of David Bohm's ideas from the plasma to the implicate order", in: B. Hiley, F. D. Peat (eds.), *Quantum Implications. Essays in Honour of David Bohm*, Routledge, London – New York 1987, p. 29.

68
Eugene P. Gross, "Collective Variables in Elementary Quantum Mechanics", in: B. Hiley, F. D. Peat, *Quantum Implications*, p. 48.

69
Bertrand Russell, *History of Western Philosophy*, George Allen & Unwin, London 1961, p. 701. See also: Nicholas Griffin, "Russell and Moore's Revolt against British Idealism", in: Michael Beaney (ed.), *The Oxford Handbook of The History of Analytic Philosophy*, Oxford University Press, Oxford 2013, pp. 383–404; P. Giladi, "Hegel, Analytic Philosophy's Pharmakon".

70
Terry Pinkard, "Speculative *Naturphilosophie* and the Development of the Empirical Sciences. Hegel's Perspective", in: Gary Gutting (ed.), *Continental Philosophy of Science*, Blackwell, London 2005, p. 19.

71
Mario Bunge, "In Praise of Intolerance to Charlatanism in Academia", *Annals of the New York Academy of Sciences* 775

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of a "mixture of nonsense, falsehoods, and platitudes enunciated in hermetic and more or less bombastic language", and for whom "the first and worst of all these charlatans was Hegel",[72] reading Hegel's philosophy greatly "added to Bohm's confusion" and "turned him into a holist", which would eventually, as Bunge further saw Bohm's later philosophical development, push the writings of "that once-brilliant scientist" into "the New Age canon".[73] Bunge's discomfort with Bohm was so great that when in 1980 Bohm visited Montreal together with the Dalai Lama, he refused to have Bohm officially invited by his university.[74]

The discomfort with the alleged 'New Ageish' kind of Bohm's 'Hegelish-mysticism', or his 'postmodernism', where the notions of 'holism' or 'wholeness' were being treated almost as slurs, has been shared by many in academia. The science writer Philip Ball, reinforcing Bunge's objections, wrote that there could be no doubt that it was the "quasi-mystical view of reality [that] has made Bohm popular with the New Age movement"[75] and even Slavoj Žižek saw Bohm's ideas belonging to the canon of an "obscurantist New Age ideology",[76] having great affinities with Hegel's philosophy, especially what is today known as the 'New Age Spirituality'.[77] For the physicist John Barrow, not only that Bohm "turned increasingly to mysticism in search of a deeper explanation of the world", but moreover that "his introspection led him in circles, and Bohm spiralled into a cycle of depression and frustrated searching", ultimately having "suffered a mental and physical breakdown".[78] For some, Bohm's allegedly 'radical turn to mysticism' was also an unforgivable ideological disappointment. For example, the physicist, mathematician, and Marxist philosopher of science Kishore Kumar Theckedath, who in the early 1970s endorsed Bohm's work as having "rescued physics from the popularizer-charlatans who are for ever looking for 'room' to smuggle in their idealist fancies",[79] wrote in a review of Bohm and Hiley's 1995 book *The Undivided Universe* that while he is "wholeheartedly recommending this book as a valuable text which should find its place on the shelf of every physics department", he could not resist closing his review without "regretting the slide of David Bohm into idealism and personally his change into somewhat of a cult figure".[80] Bohm himself noticed such sentiment toward his work particularly among those "Marxists [who] tended to use the word mysticism as an epithet", so that "everybody had to defend himself against accusations of mysticism", including himself.[81]

Of course, it cannot be denied that some trends of Bohm's wider reception and rehabilitation in popular culture, especially those under the labels such as 'quantum spirituality' or 'quantum medicine', have perhaps not done much of a favour to Bohm. Nevertheless, while understandably Bohm himself could not be responsible for potential misuses of his ideas, it remains to clarify in what sense Bohm's original thought can be characterised as 'mystical', if at all. This 'clearance' is particularly pressing in respect to the decisive influence of Hegel's philosophy on him, which, as we have seen, has been by itself broadly downplayed as 'mystical' in a distinctively pejorative fashion. To be sure, besides his well-known involvement with Krishnamurti's esoteric teachings, from the late 1950s Bohm also intensely read, as he recalled, "Buddhism or oriental philosophy, Indian philosophy, yoga, and probably some of the Christian philosophers",[82] Nicholas of Cusa certainly among the latter,[83] and the mystics like George Gurdjieff and Peter Ouspensky,[84] but this still neither qualifies him as a 'mystic', nor his thought as 'mystical' in the common sense

of these terms. Bohm himself would certainly not be satisfied with such an outlook at his work. When thus Renee Weber, who presented Bohm as a "rare combination of the scientist and the mystic combined in one person", faced Bohm with an impression that "what you have been saying sounds like mysticism", and pressed him to clarify "how does it differ from what the great mystics have said?", Bohm answered:

(1995) 1, pp. 96–115, doi: https://doi.org/10.1111/j.1749-6632.1996.tb23131.

72

Mario Bunge, "Las religiones atraerán a la gente mientras haya miseria. Entrevista Mario Bunge. Por: Gabriel Arnatz", *Filosofía hoy* 21 (Diciembre 2011), pp. 40–42, here p. 42.

73

Mario Bunge, *Between Two Worlds. Memoirs of a Philosopher-Scientist*, Springer International 2016, p. 93.

74

Ibid.

75

Phillip Ball, *Beyond Weird. Why Everything You Thought You Knew about Quantum Physics Is Different*, University of Chicago Press, Chicago 2018, p. 110.

76

Slavoj Žižek, *Did Somebody Say Totalitarianism?*, Verso, London 2001, p. 216.

77

Pat Collins, "New Age Spirituality", *The Furrow* 49 (1998), pp. 91–97, here p. 93.

78

John D. Barrow, "Christmas books. The curse of the spirit", *New Scientist* 152 (1996) November 16, p. 49.

79

K. K. Theckedath, "Marxism and quantum mechanics", p. 44.

80

Kishore Kumar Theckedath, "Review: David Bohm and the Holomovement. Reviewed Work: The Undivided Universe: An Ontological Interpretation of Quantum Theory by D. Bohm, B. J. Hiley", *Social Scientist* 25 (1997), p. 67.

81

Interview of David Bohm by Maurice Wilkins on 7 July 1986, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-3 (accessed on 31 July 2022).

82

Interview of David Bohm by Maurice Wilkins on 30 January 1987, *American Institute of Physics*, www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-7 (accessed on 31 July 2022).

83

A potential influence of the fifteenth-century cardinal, mystical theologian, philosopher, astronomer, mathematician, and reformer Nicholas of Cusa upon Bohm in developing the concepts of implicate and explicate order, and the related concepts of enfoldment and unfoldment, has been left completely unresearched by Bohmian scholars, and no major work on Bohm even mentions it, though Bohm himself gave us good reasons to do so. Bohm clearly indicated this influence, or at least his acquaintance with Cusa's work. Thus, for example, when asked about the Hegelian flavor of these concepts, Bohm replied that "well, of course, you can say that Nicholas of Cusa talked about something like this with a *implicatio*, *explicatio*, and *complicatio*". – Interview of David Bohm by Maurice Wilkins on 27 February 1987, *American Institute of Physics*. Available at www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-9 (accessed on 31 July 2022). Then, when Wilkins commented Bohm's claim that the idea of enfoldment and unfoldment also seems to be present in Hegel, Bohm replied: "Remember, I mentioned Nicholas of Cusa with his *Implicatio*, *Explicatio*, and *Complicatio*." – Interview of David Bohm by Maurice Wilkins on 6 March 1987, *American Institute of Physics*, available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-10 (accessed on 31 July 2022). David Peat was quite certain about the influence of Cusa upon Bohm's thought but without offering further evidence: "I think it was Nicholas of Cusa who developed an idea very similar to the implicate order, but you couldn't have imported Nicholas of Cusa into quantum mechanics. It just wouldn't have worked. It needed someone like David Bohm to rediscover the idea, put it in a new context and a different language. So I think that's partly what it is." – Simeon Alev, "Look for truth no matter where it takes you: F. David Peat on David Bohm, Krishnamurti and himself", *What is Enlightenment?* 6 (1997) 1, pp. 17–29, 84–87. This potential influence of Cusa upon Bohm and his Hegelianism is particularly interesting regarding the possibility that Cusa had a significant influence, direct or indirect, also upon Hegel.

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"I don't know that there's necessarily any difference. What is mysticism? The word 'mysticism' is based on the word 'mystery', implying something hidden. Perhaps the ordinary mode of consciousness which elaborately obscures its mode of functioning from itself and engages in self-deception might more appropriately be called 'mysticism'. Or we could call it 'obscurantism', and say there's an opposite mode that we could term 'transparentism', although I don't really like the suffix 'ism' in any form."[85]

As further explained in the interview, 'mysticism' was for Bohm thus simply both a domain and process of thought in which that which is "obscuring the whole" is replaced by a "transparence with respect to the whole".[86] Of course, such a response might sound 'mystical' enough by itself and thus hardly less – Hegelian, but if one gets this impression it would be because Bohm's response indeed subsumes everything he saw as virtuous and inspiring in the philosophy of the German philosopher, but only if taken in an authentic and not misconceived and misconstrued fashion.

Namely, while it is true that Hegel, just like Bohm, was also extensively studying the mystics like Jakob Böhme and Meister Eckhart, as well as a wide range of Kabbalistic, alchemical, Paracelsian, Masonic, Rosicrucian, and other esoteric and hermetic teachings,[87] this still does not mean, just like in the case of Bohm's 'mysticism', that "the Hegelian philosophy can itself be accurately described as mystical",[88] at least not without qualifying what the term means within his philosophical system. In fact, proper Hegelian positioning of the terms 'mysticism' and 'mystical' reveals that Hegel used these terms with a radically different meaning than commonly understood. In an argument apparently reiterated by Bohm in the above-cited passage, Hegel reminded us that while the Greek root word of the modern notion of 'mysticism' – μυστήριον – literary connotes something mysterious and hidden, it nevertheless does not imply a permanent inconceivability and inexplicability of that what is hidden.[89] Moreover, the 'mystical' is for Hegel a legitimate subject matter of rational discourse, but not of our Understanding (*der Verstand*), an ordinary dichotomous, formal-logical mode of thinking from which the 'mystical' is concealed in the first place. "As a whole", wrote Hegel, "the mystical is everything speculative",[90] and thus it is only upon a 'speculative philosophy' to break the hiddenness of the 'mystical'. Of course, by the term 'speculative' Hegel does not mean mere arbitrary guesswork or anything of the sort. It is his strictly technical term signifying a higher, dialectical mode of thinking related to Reason (*die Vernunft*), which can transcend dichotomies, contradictions, and impartialities of our understanding, and which is generally "animated by a sense of the greater whole to which things belong".[91] Accordingly, for Hegel, "the mystical is nothing but the speculative concept that has not yet been comprehended".[92]

It is just in this authentic Hegelian sense one needs to understand Bohm's easiness with 'mysticism' and his belief that the 'mystical' can be made 'transparent' and unveiled even in the language of science but only if it is properly rooted in Hegel's philosophy, in particular in his dialectics, which Bohm consistently tried to apply in his work throughout his mature intellectual life. It is also just in this sense that one needs to see his 'holism' as 'mystical', that is, as nothing more than a mysterious, hidden, and to the 'ordinary consciousness' most often contradictory and paradoxical aspects of reality being conceptually grasped and articulated, be these related to the quantum world, society or man. In this light, we might take Russell's words describing Hegel's philosophy as "an intellectualizing of what had first appeared to him as mystic insight"[93] to be a true description also of Bohm's intellectual

endeavour, but not in the degrading fashion Russell originally intended. After all, Bohm himself defended Hegel's philosophy against the attacks of British philosophers like Russell by assuming that this uneasiness was partly a result of they simply not knowing enough German, and partly because "they have missed the meaning of the concept [of 'speculative' generally, and *Vernunft* in particular]", so that, in turn, "had they understood the concept better, then they would have understood the German".[94] Having always felt an urge "to weave together the physical, intuitive ideas and the mathematics", in contrast to the majority of his fellow physicists, who "didn't want any intuitive understanding",[95] an encounter with the philosophy of Hegel gave Bohm a strictly rational perspective on the world allowing him "to grasp it intuitively whole, like a whole", in what he believed to be a true spirit of Hegel's speculative

See, e.g. Erwin Metzke, "Nikolaus von Cues und Hegel", *Kant-Studien* 48 (1957) 1–4, pp. 216–234, doi: https://doi.org/10.1515/kant.1957.48.1-4.216; Josef Stallmach, "Das Absolute und die Dialektik bei Cusanus im Vergleich zu Hegel", *Scholastik* 39 (1964) 4, pp. 495–509; Glenn A. Magee, *Hegel and the Hermetic Tradition*, Cornell University Press, Ithaca, New York 2001, p. 28.

84

Bohm recollected his interest in Gurdjieff and Ouspensky in the late 1950s and early 1960s as a result of his "general feeling of being let down by science and politics" (interview of David Bohm by Maurice Wilkins on 3 April 1987, *American Institute of Physics*, available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-11, accessed on 31 July 2022, and his consequent "search for a deeper meaning even beyond what could be found in philosophy as well as science" (interview of David Bohm by Maurice Wilkins on 30 January 1987, *American Institute of Physics*, available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-7, accessed on 31 July 2022). While not being affiliated with any of Ouspensky or Gurdjieff groups, in the period 1962–1964 Bohm first met in person and then extensively corresponded with the mathematician John Godolphin Bennett, who was tightly associated with Gurdjieff (for a partially published Bohm-Bennett correspondence see: Anthony G. E. Blake, *The Bohm-Bennett Correspondence 1962–1964*, DuVersity, Charles Town 1997). However, by the early 1964 Bohm completely estranged himself from Gurdjieff's teachings, starting to see them merely as "psychological tricks". – D. Peat, *The Infinite Potential*, p. 194.

85

Renée Weber, "David Bohm: The implicate order and the super-implicate order", in: Renée Weber (ed.), *Dialogues with Scientists and Sages. The Search for Unity*, Routledge & Kegan Paul, London – New York 1986, pp. 23–52, here p. 44.

86

Ibid.

87

As demonstrated in detail in: G. A. Magee, *Hegel and the Hermetic Tradition*.

88

Glenn A. Magee, "Hegel and Mysticism", in: F. C. Beiser (ed.), *The Cambridge Companion to Hegel and Nineteenth-Century Philosophy*, Cambridge University Press, Cambridge 2009, pp. 253–280, here p. 253.

89

Georg Wilhelm Friedrich Hegel, *Lectures on the History of Philosophy*, Vol. III, transl. E. S. Haldane – F. H. Simson, Kegan Paul, Trench – Trübner – London 1894, p. 448.

90

Ibid.

91

G. A. Magee, *The Hegel Dictionary*, p. 221.

92

Alper Turken, "The Mystical Content of Hegel's Concept of the Speculative", *Hegel-Jahrbuch* (2015), pp. 455–463, here p. 457, doi: https://doi.org/10.1515/hgjb-2015-0171.

93

B. Russell, *History of Western Philosophy*, p. 701.

94

Interview of David Bohm by Maurice Wilkins on 6 March 1987.

95

Interview of David Bohm by Maurice Wilkins on 7 July 1986, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-3 (accessed on 31 July 2022).

'intuitive Reason'.[96] It took time for Bohm to transform his mere personal 'mystical' intuition into the philosophical one, and in this Hegel's philosophy was certainly a decisive catalyst, however, as I demonstrate in Sections 6 and 7, such a Hegelian outlook, in particular the idea of wholeness, has been present in Bohm long before he encountered Hegel's philosophy, due to specific social and psychological conditions that were of a similar kind to those that also led the young Hegel to the philosophy of wholeness in the first place. However, before I say anything about the substance of these arguments, let me make a few general disciplinary and methodological comments about the very nature of sociological and psychological analyses of knowledge, both philosophical and scientific.

The Social and the Psychological: a Framework

In the preface to his 1820 *Philosophy of Right*, Hegel famously wrote that "as for the individual, everyone is a son of his time", and since philosophers are no exception to this, "philosophy also is its time apprehended in thoughts" (*ihre Zeit in Gedanken erfaßt*).[97] In other words, it would be "just as foolish to fancy that any philosophy can transcend its present world, as that an individual could leap out of his time or jump over Rhodes", since, as he additionally explained the idea in his *Lectures on the History of Philosophy*, "no man can overleap his time", for "the spirit of his time [*der Geist seiner Zeit*] is his spirit also".[98] Today, more than a century after the establishment of the traditional Durkheim-Mannheimian sociology of knowledge, to which Hegel should be seen as an early precursor,[99] and after fruitful decades of its subdiscipline – the sociology of philosophy,[100] Hegel's idea that philosophy does not happen in a social vacuum, and that social factors do shape the very content of philosophical knowledge should hardly come as a surprise. Moreover, as we have additionally learned from a rich body of parallel research in the sociology of scientific knowledge,[101] scientific knowledge, including the most exact one, like Bohm's own field, quantum mechanics,[102] is also not exempt from the influence of social, cultural, political, and economic milieu. As already realised in the early 1930s by one of the founding fathers of quantum mechanics, Erwin Schrödinger, both in science and in philosophy, "one's interest in a certain subject and in certain directions must necessarily be influenced by the environment or what may be called the cultural milieu or the spirit of the age in which one lives".[103] Or, as Schrödinger wrote even more directly elsewhere, with words that are almost a paraphrase of Hegel, "we all are members of our cultural milieu", so that "as soon as the direction of our interest plays a role at all in a matter, the milieu, the cultural complex, the *Zeitgeist*, or whatever you want to call it, must exert its influence".[104]

Of course, being inherently subjective and idiosyncratic, motivation in humans is a complex process of which social factors, while undoubtedly being significant, are only a part. In particular, it is a well-known psychological fact that different individuals generally react differently to the same social contexts and situations,[105] and that it is our "unique psychological structures" that make us "react somehow differently from every other person in the same situation", so that, generally speaking, "along with the environmental stimuli to which people are exposed" it is their "varying psychological structures [that] must be recognized as a major determinant of how they behave".[106] In other words, social factors are propensities of one's cognitive development

and behaviour that are realised depending on their temperament, and different sets of regressive, repressive, and compensatory psychological determinants in different persons might modulate perception of the same social world in different directions. In the final instance, as believed by Johann Gottlieb Fichte, "the kind of philosophy one chooses depends upon the kind of person one is", for a "philosophical system is not a lifeless household item one can put aside or pick up as one wishes; instead, it is animated by the very soul of the person who adopts it".[107]

Some, like William James, a philosopher and a psychologist, even claimed that generally the history of philosophy "is to a great extent that of a certain

96
Interview of David Bohm by Maurice Wilkins on 6 March 1987. See also the rest of that interview for the flavor of Bohm's informed philological and philosophical understanding of Hegel's basic terms like *Verstand* and *Vernunft*, as well as the one conducted on 27 February 1987: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-9 (accessed on 31 July 2022).

97
Georg Wilhelm Friedrich Hegel, *Philosophy of Right*, transl. S. W. Dyde, George Bell and Sons, London 1896, p. xxviii.

98
Georg Wilhelm Friedrich Hegel, *Lectures on the History of Philosophy*, vol. III, p. 96.

99
See, e.g. Peter Knapp, "The Question of Hegelian Influence upon Durkheim's Sociology", *Sociological Inquiry* 55 (1985) 1, pp. 1–15, doi: https://doi.org/10.1111/j.1475-682x.1985.tb00848.x; Peter Knapp, "Hegel's Universal in Marx, Durkheim, and Weber: The Role of Hegelian Ideas in the Origin of Sociology", *Sociological Forum* 1 (1986) 4, pp. 586–609, doi: https://doi.org/10.1007/bf01107338.

100
See, e.g. Randall Collins, *The Sociology of Philosophies. A Global Theory of Intellectual Change*, Belknap Press of Harvard University Press, Cambridge (MA) 1998; Carl-Göran Heidegren, Henrik Lundberg, "Towards a Sociology of Philosophy", *Acta Sociologica* 53 (2010) 1, pp. 3–18, doi: https://doi.org/10.1177/0001699309357831.

101
See, e.g. Harry M. Collins, "The Sociology of Scientific Knowledge: Studies of Contemporary Science", *Annual Review of Sociology* 9 (1983) 1, pp. 265–285, doi: https://doi.org/10.1146/annurev.so.09.080183.001405; Nico Stehr, Volker Meja, *Society and Knowledge. Contemporary Perspectives in the Sociology of Knowledge and Science*, Routledge, London – New York 2018.

102
See, e.g. Alexei B. Kojevnikov, Cathryn Carson, Helmuth Trischler (eds.), *Weimar Culture And Quantum Mechanics. Selected Papers By Paul Forman And Contemporary Perspectives On The Forman Thesis*, Imperial College Press & World Scientific, London – Singapore 2011; see also Olival Freire Jr (ed.), *The Oxford Handbook of the History of Quantum Interpretations*, Oxford University Press, Oxford 2022, esp. various contributions in "Part III: Places and Contexts Relevant for the Interpretations of Quantum Theory" (pp. 521–795) and "Part IV: Historical and Philosophical Theses" (pp. 797–956).

103
Erwin Schrödinger, *Science and the Human Temperament*, George Allen & Unwin, London 1935, p. 61.

104
Erwin Schrödinger, "Ist die Naturwissenschaft milieubedingt?", in: Karl von Meyenn (ed.), *Quantenmechanik und Weimarer Republik*, Vieweg, Braunschweig, Wiesbaden 1994, pp. 295–332, here p. 308.

105
See, e.g., Kenneth S. Bordens, Irwin A. Horowitz, *Social Psychology*, Lawrence Erlbaum Associates, Mahway (NJ) 2002, p. 5.

106
Richard S. Lazarus, *Personality*, Prentice-Hall, Englewood Cliffs (NJ) 1971, p. 3.

107
Johann G. Fichte, *Introductions to the Wissenschaftslehre and Other Writings (1797–1800)*, transl. Daniel Breazeale, Hackett Publishing, Indianapolis – Cambridge 1994, p. 20.

clash of human temperaments",[108] and Karl Jaspers, a philosopher and a psychiatrist, put a psychologically protective function of the systematic philosophy at the centre of his general psychology of worldviews.[109] Such statements, which can be found made by eminent philosophers throughout the history of philosophy, are not only a matter of individual philosophical extravagance.[110] Though not established as a formal subdiscipline of psychology, as the sociology of philosophy, there is a long, continual, and ever-improving effort of both philosophers and psychologists to reveal the psychological underpinnings of philosophy,[111] which does not abate even today. For example, one quite recent empirical study performed on a sample of contemporary professional philosophers, confirmed that "psychological factors play some role in determining some of the philosophical views that one holds – and/or vice-versa".[112] To be sure, just like in the case of sociological approaches to science paralleling those to philosophy, scientific knowledge is also no exception to such a psychological analysis, as far as a large body of propulsive research in the psychology of science – "a missing brick in the wall of science studies until the mid-2000s"[113] – in the last few decades, following Abraham Maslow's seminal 1966 book *The Psychology of Science*, is concerned.[114]

It is just these sociological and psychological perspectives on philosophy and science, integrated into a unique social psychological approach recognising that "the sociocultural circumstances impose constraints and provide opportunities for the operation of individual-difference and developmental variables",[115] from which I intend to offer a comparative analysis of the external social and internal individual contexts of Bohm's and Hegel's early developments. In particular, I intend to test the hypothesis that there existed the social conditions of fragmentation of a similar kind both in the Swabian homeland of Hegel at the end of the 18th century and in the American homeland of Bohm in the late 1920s and early 1930s that strongly shaped their shared negative receptivity to the phenomenon of fragmentation and consequently their strong lifelong urge for overcoming it through affirming the organicistic and synthetic against the atomistic and analytic worldview. If true, it would then not come as a surprise that the chronologically later and independent social setting of Bohm's early development not only inclined him toward a whole-hearted embrace of Hegel's philosophy of wholeness later in his scholarly life but also that he was predisposed to it long before he read anything of Hegel. Nevertheless, following our social psychological approach, this would only be half of the story. While similar social conditions might lead to similar cognitive outcomes in Hegel and Bohm – to their common abhorrence of fragmentation and affection for wholeness – this is generally not necessarily the case, as noticed above, so the additional question naturally arises: were there also some common psychological determinants of Hegel's and Bohm's early development that modulated similar social conditions into similar cognitive outcomes? The affirmative to this dilemma will be the second hypothesis I intend to test, however, in an attempt to test these hypotheses, certain critical methodological questions still need to be answered, with one of the most acute certainly being the question of how the analysis of Hegel's and Bohm's idiosyncratic determinants can be done in a reliable manner. In particular, considering that most of the evidence in our analysis will consist of materials self-reported by Hegel and Bohm either in the form of journal entries, letters, and written narratives in their published works (both in Hegel's and Bohm's cases) or oral history interviews (exclusively in Bohm's case), one might pose the question: how sure we can be that they were reporting their unbiased

experiences, or instead perhaps their experiences as retroactively interpreted through the lens of their current interests?

Part of the solution to this dilemma, as far as the evidence of Hegel's and Bohm's shared early developmental motivations drawn from their journal entries and correspondence is concerned, is straightforward: these archival documents, though self-reported, capture the social and psychological sentiments of the two thinkers originating just from their formative years under concern, and not some retroactive personal interpretations. On the other hand, it is true that oral history interviews, which are extensively used in Bohm's case, are "often conducted years after the event, when memories have grown imprecise", however, it is also agreed that they have "the advantage of being conducted by a trained interviewer who can raise questions and challenge dubious answers".[116] In the case of Bohm's comprehensive and detailed recollections recorded by skilled and knowledgeable interviewers for the Archives for History of Quantum Physics, a large project comprising more than 3000 hours of taped interviews with some 1500 scientists, such a requirement might be considered fairly met.[117] Understandably, while "memory is not history" in the strictest sense, "it is certainly not the *opposite* of history",[118] and

108
William James, *Pragmatism. A New Name for some Old Ways of Thinking*, Longmans, Green & Co, London – Bombay – Calcuta 1907, p. 6.

109
Karl Jaspers, *Psychologie der Weltanschauungen. Vierte, unveränderte Auflage*, Springer-Verlag, Berlin – Heidelberg 1954.

110
For a historical and conceptual critical overview of the psychology of philosophy, see, e.g.: Boris Kožnjak, "Filozofija kao životopis i životopis filozofije", in: B. Kožnjak (ed.), *Godišnjak za filozofiju. Uloga i mjesto filozofije u suvremenom društvu*, Institut za filozofiju, Zagreb 2018, pp. 67–88.

111
See, e.g. Richard Müller-Freienfels, *Persönlichkeit und Weltanschauung, psychologische Untersuchungen zu Religion, Kunst und Philosophie*, Teubner, Leipzig – Berlin 1919; Oskar Pfister, *Zur Psychologie des philosophischen Denkens*, Bircher, Bern 1923; Alexander Herzberg, *The Psychology of Philosophers*, Kegan Paul, Trench, Trübner & Co., London 1929; Ben-Ami Scharfstein, *The Philosophers. Their Lives and the Nature of their Thought*, Oxford University Press, Oxford 1989–1980.

112
David B. Yaden, Derek E. Anderson, "The psychology of philosophy. Associating philosophical views with psychological traits in professional philosophers", *Philosophical Psychology* 34 (2021) 5, pp. 721–755, here p. 731.

113
Gregory J. Feist, Michael E. Gorman, "Introduction. Another Brick in the Wall", in: Gregory Feist, Michael E. Gorman (eds.), *Handbook of the Psychology of Science*, Springer, New York 2002, pp. 3–19, here p. 3.

114
Abraham Maslow, *The Psychology of Science. A Reconnaissance*, Harper & Row, New York 1966. For a wider context of Maslow's psychology of science and its relationship to the philosophy of science, see: Boris Kožnjak, "Kuhn Meets Maslow. The Psychology Behind Scientific Revolutions", *Journal for General Philosophy of Science* 48 (2017) 2, pp. 257–287, doi: https://doi.org/10.1007/s10838-016-9352-x.

115
Dean Keith Simonton, "Creative Genius in Science", in: G. Feist, M. E. Gorman, *Handbook of the psychology of science*, pp. 251–272, here p. 264.

116
Donald A. Ritchie, *Doing Oral History. A Practical Guide*, Oxford University Press, Oxford 2003, pp. 26–27.

117
See: Ronald E. Doel, "Oral History of American Science: A Forty-Year Review", *History of Science* 41 (2003) 4, pp. 349–378, doi: https://doi.org/10.1177/007327530304100401.

118
Ibid., p. 350.

in this sense, personal recollections nevertheless provide researchers with valuable material complementing usual historical records, especially concerning "scientists' family background, the origins of their interest in their subjects, the psychological and social processes influencing and constraining the development of their taste, style, and values, and their socialization as professionals".[119] Of course, as it is also agreed by the researchers in the field of qualitative (psycho)biographical case studies, who have generally extensively addressed the problem of reliability of these studies,[120] no single piece of biographical data should be taken as evidence alone without testing it against the background of other evidence preferably obtained by using multiple sources, methods, and perspectives, and it is by a thorough implementation of just this strategy of 'triangulation', which has become the gold standard of achieving the convergence of evidence in such studies,[121] that the present author hopes for a reconstruction of the shared idiosyncratic determinants of Hegel's and Bohm's early development as a reliable undertaking in the following sections.

Bohm and Hegel: Time Apprehended in Thoughts

As to the formative social factors in Bohm's intellectual development, it was Bohm himself who first brought them to consciousness with the utmost precision, realising that "a person depends very much on the community he happened to grow up in".[122] What Bohm found especially important in his experience of growing up in Wilkes-Barre (where he was born in 1917), a small mining town in Pennsylvania populated mainly by Polish and Irish coal miners with a small and isolated community of Jewish immigrants, where his parents Samuel Bohm (originally named Shmuel Düm) and Frida Bohm (born as Frieda Popky), both Jewish immigrants from Europe, ran a furniture store, were the strong prejudicial tensions between the two communities. He soon realised that the "Polish/Irish had a poor view of the Jews", but also that the reverse was also the case, i.e. that the "Jewish community often looked down on the Polish/Irish".[123] However, the young Bohm decided to distance himself from the prejudices of both communities, trying to remain an outside observer, while at the same time trying to maintain "ties to both communities".[124] This strategy allowed him not only to see more clearly the prejudices the two communities shared for each other but also to "see some truth in both sets of criticisms".[125] By taking "a stance a bit beyond that", growing up stretched between the two cultures taken out of their European roots and suspended in a new, American culture, the young Bohm realised, on the one hand, "that all of us were conditioned", but, on the other hand, that there always exists a ground for dialogue and thus refused to believe that social conditions are not improvable, taking the view "that human society, human beings were perfectible".[126]

Another important formative social factor in Bohm's intellectual development was the Great Depression of the late 1920s and early 1930s, which devastated his hometown, leading to unemployment, insecurity, and social unrest (see Figure 1). Besides the deepening of his feeling of cultural fragmentation, the experience of social fragmentation due to the Great Depression shook the young Bohm's beliefs in the American Dream and individualism and replaced them with a 'dream of social justice' and the need for a more collective attitude toward society. As Bohm recollected these decades, "in the beginning, I believed in all the conservative ideas about individualism, but then the

depression made me begin to question those and saying that the society must have some responsibility".[127]

Member of the Associated Press

Wilkes-Barre Record

WEATHER FORECAST
Eastern Pennsylvania — Rain Tuesday. Wednesday cloudy and colder preceded by rain or snow.

WILKES-BARRE, PA., TUESDAY MORNING, OCTOBER 29, 1929—THIRTY-TWO PAGES.

PRICES AGAIN COLLAPSE ON STOCK MARKET

BINGHAM HITS BACK AT SENATE ACCUSERS

Motion for His Censure May Be the Outcome of a

STORMY DEBATE ON FLOOR OF SENATE

New Englander Declares Lobby Committee Was "Framed" Against Him

She is Engaged

No Opposition Raised To Kahn

President and Senators Satisfied With His Appointment as Treasurer

Senator Burton Dies At Home In Washington

Brilliant Career of Ohio Statesman Comes to End

AFTER LONG ILLNESS

His Passing is Cause of Grief in Official Circles

Reed Predicts Death Of The Tariff Bill

Tells Senate That Measure in Its Present Form Will Be

KILLED BY THE HOUSE

Other Senators Call on Hoover to State His Position

VALUES SUFFER SHARPEST DROP EVER EXPERIENCED IN ONE DAY

GIRL WHO WON SUIT AGAINST THAW DELUGED BY PROPOSALS

Crash Came When Powerful Financial Interests Step Aside

LOWEST LEVEL IN THE YEAR REACHED

Pathetic Scenes Witnessed in Some of the Broker Offices

Bankers Will Enter Market

They Will Be Buyers Today of the Best Grade Stocks

Bond Market Is Irregular

Only Issues of Prime Investment Value Make Progress

Values Break On Curb Market

Nearly 175 Issues Finish at New Lows for the Year

Figure 1. Frontpage of *Wilkes-Barre Record*, a local newspaper published in Bohm's hometown, reporting on the stock market collapse at the dawn of the infamous Black Tuesday on 29 October 1929. The Great Depression, together with the permeating social and cultural fragmentation of his local society at the time, had a great impact on the young Bohm. From: https://www.newspapers.com, public domain.

As a result of his early experiences, overcoming the cultural and social fragmentation, which leads "to a kind of general confusion of the mind" and "creates an endless series of problems and interferes with our clarity of perception so seriously as to prevent us from being able to solve most of them",[128] will become the main hallmark of Bohm's whole mature life and work. In

119

Charles Weiner, "Oral History of Science: A Mushrooming Cloud?", *The Journal of American History* 75 (1988) 2, pp. 548–559, here p. 549, doi: https://doi.org/10.2307/1887871.

120

See, e.g. William M. Runyan, *Life histories and psychobiography. Explorations in Theory and Method*, Oxford University Press, New York 1982; Brian Roberts, *Biographical Research*, Open University Press, Buckingham – Philadelphia 2002; William Todd Schultz, *Handbook of Psychobiography*, Oxford University Press, Oxford 2005.

121

See, e.g. Robert K. Yin, *Case Study Research and Applications. Design and Methods*, SAGE Publications, London 2018, espe. pp. 196–199.

122

Interview of David Bohm by Maurice Wilkins on 12 June 1986, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-2 (accessed on 31 July 2022).

123

Ibid.

124

Ibid.

125

Ibid.

126

Ibid.

127

Ibid.

128

D. Bohm, *Wholeness and the Implicate Order*, p. 2.

fulfilling this goal, as Bohm started to believe also early in his life, science should have the most important role, not only as a road to knowledge about the world but also as essentially a global social activity that could "also help the betterment of mankind politically by eliminating poverty and increasing rationality by creating a spirit of greater rationality".[129] However, as Bohm soon came to realise, there was a great obstacle for science to partake in this 'greater rationality' since by itself "the current scientific self-world view is [also] very fragmentary in its ultimate implications",[130] and was thus a part of the problem, not its straightforward miracle solution. Therefore, for Bohm, science also had to be redefined even in the most exact fields like physics, which is particularly "demanding a new, non-fragmentary world view, in the sense that the present approach of analysis of the world into independently existent parts does not work very well in modern physics".[131] Advocating the need for one such all-encompassing "new kind of creative surge", which, in order to overcome the existing fragmentation of science, society, and man, should "include not just a new way of doing science but a new approach to society, and even more, a new kind of consciousness",[132] will become Bohm's life project, however, as we have seen, this program was charted already by his youthful emotional response to specific societal challenges he was facing. On this, Bohm himself, once again, could not have been clearer, for example, when approving Wilkins' comment that "this whole idea of unity then and unification and the breaking down of barriers and fragmentation" have arisen "out of your experiences there in that society", or when Bohm also decidedly approved the interviewer's comment that "it's really the wholeness thing [that] goes right back to your teen age", adding readily further that there were also "the seeds of the implicate order and my work on its apology".[133]

Hegel would not be surprised by such an intellectual mood and its emotional genesis in Bohm. Born in 1770 in Stuttgart, in what is now south-western Germany but was then the Duchy of Württemberg, just one of hundreds of Germanic miniature city-states (pejoratively called at the time *Kleinstaaterei*) under the old Holy Roman Empire, in a family of Protestant ministers living in a Protestant enclave within a largely Catholic region (see Figure 2) in the twilight of the Enlightenment (*Aufklärung*) and the dawn of the Romantic *Sturm und Drang*, the young Hegel was also intellectually developing in turbulent times of social, cultural and political fragmentation, economic instability, class struggles, and prejudices.[134]

The question of revolution was thus acutely on the agenda in Germany at the time, and the young Hegel, together with what would become known as the Early Romanticism (*Frühromantik*) group in the last few years of the eighteenth century in Jena, which gathered also Friedrich Schlegel, August Wilhelm Schlegel, Friedrich Schelling, Novalis, Friedrich Hölderlin, and other young philosophers and artists, followed closely the developments in France with great expectations, hoping for something similar also in their homeland. However, as the Revolution showed its self-destructive terror face betraying its own principles, the group turned their hopes to a revolution in ideas and aesthetics instead.

In particular, becoming increasingly critical of the whole Enlightenment program, which they inherently linked to the Revolution, in order "to preserve the fundamental values of modernity – individuality, critical rationality, and freedom" but "within their holistic ideals",[135] the group passionately embraced *Naturphilosophie* as a platform for which they believed it could

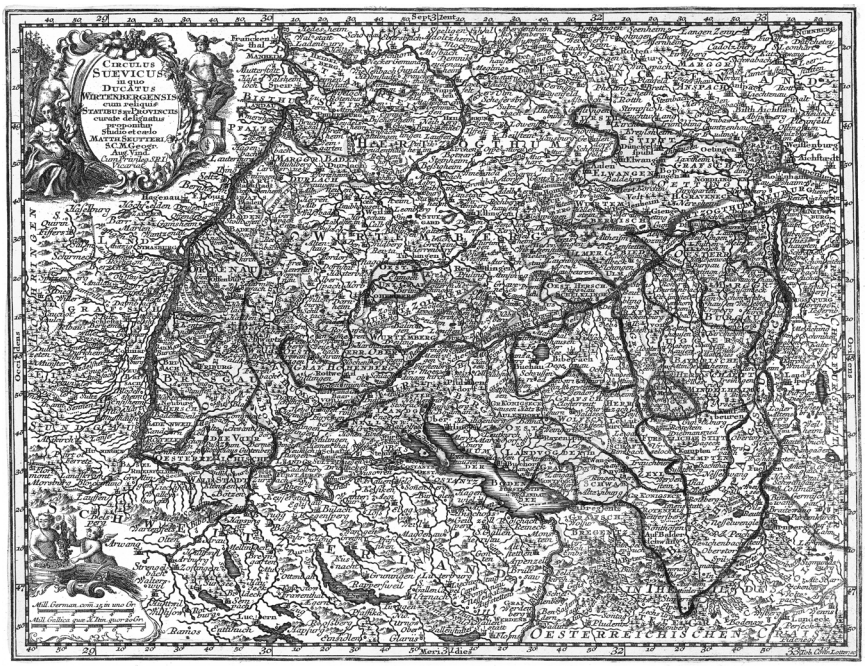

Figure 2. The mid-eighteenth-century map of the Duchy of Württemberg, Hegel's region of birth, childhood, and early youth, surrounded by other territories of the 'Swabian circle', all being part of a larger Germanic territory consisting of several hundred secular and ecclesiastical mini-states particularised as duchies, principalities, counties, bishoprics or free cities, all fragmented within as well into enclaves and exclaves, under the reign of the Holy Roman Empire, itself consisting of up to two thousands of such states. – "Circulus Suevicus: in quo Ducatus Wirtenbergensis cum reliquis Statibus Et Provinciis", in: Matthaeus Seutter, Jacob Christoph Weyerman, *Atlas minor praecipua orbis terrarum imperia, Regna et Provincias, Germaniae Potissimum*, Augsburg 1754, public domain.

break through the limitations of Kant and Kantians, for whom their organic concept of nature was a "relapse into the worst kind of dogmatic metaphysics",[136] and keep them up with major scientific questions that were arising in chemistry, physics, biology, and other 'exact sciences' without losing sight of

129
Ibid.

130
D. Bohm, "Fragmentation and wholeness in religion and in science", p. 127.

131
D. Bohm, *Wholeness and the Implicate Order*, p. xiii.

132
D. Bohm, D. Peat, *Science, Order, and Creativity*, p. 207.

133
Interview of David Bohm by Maurice Wilkins on 6 June 1986, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-1 (accessed on 31 July 2022).

134
For Hegel's biography, his intellectual development and the socio-cultural contexts of his life and work see, e.g. Walter Kaufman, *Hegel. A Reinterpretation*, University of Notre Dame Press, Notre Dame – Indiana 1965; Henry S. Harris, *Hegel's Development. Toward the Sunlight 1770–1801*, Clarendon Press, Oxford 1972; Raymond Plant, *Hegel*, George Allen & Unwin, London 1973; Terry Pinkard, *Hegel. A Biography*, Cambridge University Press, Cambridge 2000; Frederick Beiser, *Hegel*, Routledge, New York – London 2005.

135
Frederick Beiser, *The Romantic Imperative. The Concept of Early German Romanticism*, Harvard University Press, Cambridge (MA) – London 2003, p. 33.

the unity of nature they were striving at.[137] It was just this milieu that turned crucial for Hegel's development and his philosophy.[138] Important to notice, Bohm and his closest associate Hiley were not only aware of the Romantic roots of Hegel's philosophy,[139] as well as of the fact that many developments in nineteenth-century science can be traced back to the Romantics, but were also sharing similar Romantic sentiment. Besides Hegel, Bohm also studied Coleridge,[140] and Hiley referred not only to Fichte and Schelling but also the algebras of Grassmann and Hamilton, both closely related to the Romantic movement,[141] as philosophically and mathematically the most appropriate reflections of "the notion of wholeness" and "direct experience of flux, activity, and process".[142]

Just like in the case of Bohm a century and a half later within his social setting, Hegel was thus not only deeply disturbed and strongly influenced by the social and cultural milieu of his youth, but it was this milieu that led him to philosophy in the first place. As he wrote in a letter dated 2 November 1800, to his fellow philosopher and a friend Schelling,

> "… in my intellectual development, which started from the more subordinate needs of man, I was inevitably driven toward philosophy, and the ideal of my youth had to take the form of reflection and thus at once of a system."[143]

In his first published work in 1801, Hegel transformed this personal motivation for philosophy into a general rational program, having realised once and for all that 'the need for philosophy' arises "when the might of union vanishes from the life of men and the antitheses lose their living connection and reciprocity and gain independence",[144] or, as he put more bluntly, that "fragmentation (*Entzweiung*)[145] is the source of the need for philosophy".[146] Consequently, overcoming the fragmentation of man and the world, which he vividly described as an urge of 'bringing man back home again', i.e. as the need to give back to man a feeling of 'being at home' (*zu Hause*) or of 'homeliness'/'at-homeness' (*Heimatlichkeit*) in the world,[147] both in the sense of 'being at home with oneself' (*Beisichselbstsein*) and 'being at home with oneself in otherness/in another' (*Beisichselbstsein im Anderssein/im Anderen*),[148] significantly rendered also as "being at home with oneself in the whole",[149] would become the main tenet of his long and fruitful philosophical endeavour.[150] Much like science for Bohm, so did philosophy for Hegel become an important social activity that can, as he firmly believed, contribute to this overcoming, and to this end the notions of *the whole* (*das Ganze*), *wholeness* (*Ganzheit*), and *totality* (*Totalität*) will significantly occupy the key positions in his philosophical system, crowned with the famous sentence from the preface to his magnum opus *The Phenomenology of Spirit* – "The True is the whole" (*Das Wahre ist das Ganze*).[151]

Of course, one could object to such a sociological perspective on Hegel's and Bohm's intellectual development that fragmentation in society can be found in most times and places, moreover, that any kind of human conflict or strife can be interpreted as a 'fracture' in society, and that consequently, we would be hard-pressed to find a single person without such experience, with both Hegel's fragmented Swabian homeland at the end of the 18th century and Bohm's fragmented American homeland in the late 1920s and early 1930s thus being in no way historically unique. However, even if we admit such an empirically inadequate view of history as a permanent state of social fragmentation without interchanging periods of relative social cohesion, against the social cycle theory, a modern sociological account of the ancient

belief that social stages repeat in cycles of 'Dark' and 'Golden' ages,[152] this would still not diminish the motivational potential of fragmentation as a social variable of one's cognitive development. Namely, even if we admit that fragmentation is universal across times and places, cognitive reactions to it

136

Frederick Beiser, "Kant and *Naturphilosophie*", in: Michael Friedman, Alfred Nordmann (eds.), *The Kantian Legacy in Nineteenth-Century Science*, The MIT Press, Cambridge (MA) – London 2006, pp. 7–26, here p. 7.

137

See, e.g.: Henricus A. M. Snelders, "Romanticism and *Naturphilosophie* and the Inorganic Natural Sciences 1797–1840: An Introductory Survey", *Studies in Romanticism* 9 (1970) 3, pp. 193–215; Robert J. Richards, *The Romantic Conception of Life. Science and Philosophy in the Age of Goethe*, University of Chicago Press, Chicago 2002; Michael Friedman, "Kant-Naturphilosophie-Electromagnetism", in: M. Friedman, A. Nordmann (eds.), *The Kantian Legacy in Nineteenth-Century Science*, pp. 51–80.

138

See: Frederick Beiser, "Hegel and *Naturphilosophie*", *Studies in History and Philosophy of Science* 34 (2003) 1, pp. 135–147, doi: https://doi.org/10.1016/s0039-3681(02)00083-3.

139

Interview of David Bohm by Maurice Wilkins on 3 October 1986, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-5 (accessed on 31 July 2022).

140

See: D. Bohm, D. Peat, *Science, Order, and Creativity*, p. 262.

141

See: Thomas L. Hankins, *Sir William Rowan Hamilton*, Johns Hopkins University Press, Baltimore 1980; Marie-Luise Heuser, "The Significance of Naturphilosophie for Justus and Hermann Grassmann", in: H. J. Petsche *et al.* (eds), *From Past to Future. Graßmann's Work in Context*, Springer, Basel 2011, pp. 49–59.

142

Basil J. Hiley, "Time and the Algebraic Theory of Moments" (2013), arXiv:1302.2323v1 [quant-ph], pp. 1–29, here p. 5, doi: https://doi.org/10.48550/arXiv.1302.2323. See also: Basil J. Hiley, "Panta rei – An Interview with Professor Basil Hiley, by Arleta Griffor", in: Keith G. Bowden (ed.), *Aspects II: Proceedings of ANPA 20*, Alternative Natural Philosophy Association, Barking 1999, pp. 262–276; Interview of Basil Hiley by Olival Freire on 11 January 2008.

143

Georg Wilhelm Friedrch Hegel, *The Letters*, transl. C. Butler – C. Seiler, Indiana University Press, Bloomington 1984, p. 64. I have slightly adapted the translation here by replacing the term 'science' with 'philosophy', to avoid the modern connotations of the term 'science'. Of course, in the original Hegel uses the term *Wissenschaft* in the literal sense of 'science' but having a systematic philosophical knowledge, with the capital P, in his mind.

144

Georg Wilhelm Friedrich Hegel, *The Difference Between Fichte's and Schelling's System of Philosophy*, transl. H. S. Harris – Walter Cerf, State University of New York Press, Albany 1977 (1801), p. 91.

145

The original Hegel's technical term *Entzweiung* literally means *division* or *split* (into halves), and has been translated into English in various forms, e.g., as *dichotomy*, *cleavage*, *diremption*, *disseverance*, *disunity*, *dissociation*, *separation*, and even as *estrangement* or *alienation*. Since Hegel uses the term as a kind of "diagnosis of modernity and civil society" (Herbert Marcuse, *Reason and Revolution. Hegel and the Rise of Social Theory*, Routledge & Kegan Paul, London 1987, p. 336), *fragmentation* seems an appropriate umbrella translation for all these common translations. On Hegel's notion of *Entzweiung* see also: Edmundo Balsemão Pires, "Hegel's Concept of 'Entzweiung' and Luhmann's Account of 'Ausdifferenzierung'", *Hegel-Jahrbuch* (2002), pp. 355–361, doi: https://doi.org/10.1524/hgjb.2002.4.jg.355.

146

G. W. F. Hegel, *The Difference Between Fichte's and Schelling's System of Philosophy*, p. 89.

147

See, e.g. G. W. F. Hegel, *Lectures on the History of Philosophy*, volume I, transl. E. S. Haldane, Kegan Paul, Trench, Trübner – London 1892, pp. 150–151. For Hegel's concept of *Heimatlichkeit* see, e.g. Achim Wambler, "Der Begriff Heimat bei Hegel", *Hegel-Jahrbuch* 11 (2018), pp. 65–69.

are generally not. In particular, not all persons affected by a fragmented society – philosophers and scientists included – necessarily experience fragmentation negatively, let alone transform this negative experience into a system of thought or a worldview the main tenet of which is just the overcoming of this condition, as Hegel and Bohm did. In fact, throughout human history, social holism has been faithfully opposed by social atomism as one of the two main conflicting views on the nature of human society and man,[153] the former taking social order as being "brought about through the free negotiations of autonomous individuals seeking to advance private interests", and the latter accounting "for social order by reference to assumptive or emergent properties of collectivities that are independent of, and antecedent to, interaction among particular individuals".[154]

Social fragmentation, therefore, regardless of whether it is historically universal or contingent, and regardless of whether social atomism and holism are a sort of mutual 'actions' and 'reactions' in interchangeable historical cycles of social fragmentation and cohesion, is that kind of a sociocultural milieu that always influences one's cognitive standpoint on the nature of society and man, although its direction might not be uniquely determined by the milieu itself. It is for this reason that we take fragmentation as a social variable of one's development only as a propensity for a particular cognitive outlook at fragmentation itself, the actualisation of which ultimately depends on one's psychological determinants as modulating factors of the available social propensities, or to put it again in technical terms, as a sociocultural milieu that imposes "constraints and provides opportunities for the operation of individual-difference and developmental variables".[155] What these processes might be in Hegel's and Bohm's cases is the subject matter of the next section.

Bohm and Hegel: Thought Apprehended in Temperaments

As to the emotional and psychological circumstances of Bohm's upbringing, one circumstance strongly marked his childhood and youth: not only that Bohm grew up in a culturally and socially fragmented, and economically depressed community, but also in an insecure, chaotic, and at times violent family climate torn by constant quarrels between his parents, usually starting with his father's insults and continuing with his mother's anger, rage, and hysteria.[156] As a result, Bohm soon became a "somewhat nervous and mixed" person with "neurotic reactions", "anxious, sometimes bad-tempered, and so on".[157] However, as a retreat from these emotionally threatening circumstances and events, Bohm started to imagine "another environment where this wouldn't happen", becoming obsessed with the idea "that I could be happier somewhere else, in some other environment… somehow".[158] Very early in his life Bohm thus started "looking forward to something new", to some "unlimited range of vistas".[159] Although this his striving would later find its full realisation in his science and philosophy, at the time of his childhood and youth Bohm found these 'new vistas' in nature and mountains in particular, which he visited alone quite often first in the surrounding of his Wilkes-Barre home, and then, even more often, while being at college in the middle of Pennsylvania, as well as a student at Berkeley, when "nature, the trees, climbing up", and generally "the whole beauty of the whole thing" had been 'enlightening his spirit'.[160] Similarly, Hegel also developed a passionate "Rousseauian appreciation for Nature"[161] already in his youth, and also as a

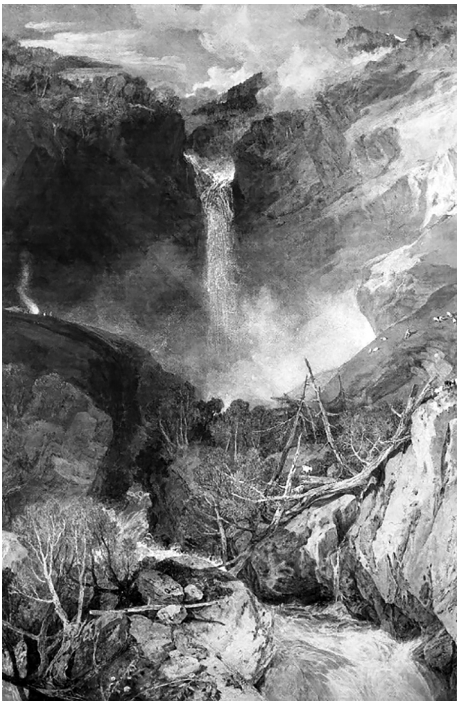

Figure 3. *The Great Falls of the Reichenbach* (1804), watercolour, by Joseph Mallord William Turner. The falls greatly impressed and influenced the young Hegel while residing in Switzerland in 1793–1796. Turner's work will also greatly inspire Bohm later in his life. From: The Higgins Bedford, Bedfordshire, England, UK. Available at: https://www.thehigginsbedford.org.uk, public domain (CC BY-NC-ND 4.0).

retreat from the emotional turmoil of his life, which was similarly permeated with severe anxiety and depression, from which he suffered "to the point of exhaustion".[162] While remembering his four years stay in Switzerland, where he went in 1793 as a tutor to the children of the von Steiger family, Hegel described these years as the time of "reconciling myself there in the arms

148
See, e.g., G. W. F. Hegel, *Philosophy of Right*, p. 19.

149
Christian Hofmann, "Being at Home with Oneself in the Whole – Hegel's Philosophy of Freedom as Actuality", in: C. Krijnen (ed.), *Concepts of Normativity. Kant or Hegel?*, Brill, Leiden – Boston 2019, pp. 9–25.

150
For the notion of *Beisichselbstsein* pervading Hegel's thought from the *Phenomenology of Spirit* onwards see, e.g., Simon Lumsden, "At Home with Hegel and Heidegger", *Philosophy Today* 59 (2015), pp. 7–21.

151
G. W. F. Hegel, *Phenomenology of Spirit*, transl. A. V. Miller, Oxford University Press, Oxford 2004, p. 11. This famous sentence in §20 of the "Preface" to the *Phenomenology* is commonly translated as "The Truth is the whole.", but here Hegel uses the adjectival noun 'Das Wahre' ('the True') and not the noun 'Die Warheit' ('the truth'). For a significant difference between the two terms in light of Hegel's philosophy, see: Donald Phillip Verene, *Hegel's Absolute. An Introduction to Reading the* Phenomenology of Spirit, State University of New York Press, Albany 2007, p. 119.

152
See, e.g. Pitirim A. Sorokin, "A Survey of the Cyclical Conceptions of Social and Historical Process", *Social Forces* 6 (1927) 1, pp. 28–40, doi: https://doi.org/10.2307/3004654; Michel P. Richard, "Sorokin and Social Change", *Social Science* 52 (1977), pp. 94–98.

of nature with myself and with men", adding however that he continues to "often flee to this faithful mother, separating myself again with her from the men with whom I live in peace, preserving myself under her auspices from their influence, forestalling an alliance with them.[163] Hegel's private letters are permeated with mountain imagery and he even, just like Bohm in his interviews, often mentions 'open vistas', both literary as pleasing rewarding views "from the mountaintop down",[164] and symbolically as "magnificent vistas open up before us in the grand world-historical manner".[165] However, Bohm's and Hegel's shared fascination with nature should not be seen as a mere ephemeral tourist enthrallment and even less as mere acute satisfaction of self-help needs.

As to Hegel, one event that has left a permanent mark on his whole intellectual development is particularly telling about his deeper perception of nature. In the summer of 1796, Hegel went to the mountains of the Bern region by foot in the company of three other tutors, and he kept a detailed journal of this trip.[166] Although the region has what the majority of tourists would commonly see as the magnificent Bernese Alps – the cloudy peaks of Jungfrau, Mönch, and Eiger, all about or above four kilometres of height – for Hegel, however, these peaks were by themselves nothing more than "eternally dead masses", offering him only "the monotonous and at length boring notion: *that is how it is*".[167] They were worth a difficult climb, often during extremely bad weather, as Hegel wrote, only as a means of reaching a spacious view at the "majestic spectacle" of the Staubbach and Reichenbach falls (see Figure 3), with their "gracious, unconstrained, free, and playful descent of the water dust".[168]

As Hegel further wrote in his journal, in these waterfalls, where at first a narrow stream of water "falls down vertically in much wider waves", continually drawing "the spectator's glances down with them" but "which one nevertheless can never fix, never follow" for "their image, their form, dissolves every few moments and is replaced by another", he saw "eternally the same image, and at the same time that it is never the same".[169] In such a perspective, concluded thus Hegel, "any thought of the constraint, of the must of nature, remains quite remote, and the life that always dissolves, leaps apart, and is not united in one mass but eternally moves on actively rather produces the image of free play".[170] Hegel's youthful perception of nature, seen through his imaginative temperament, was of the essentially dynamic and organic nature of waterfalls he was so fascinated with, in contrast to the static and disintegrated nature of the Jungfrau massif, capturing thus intuitively all that would later become the basic rationalised tenets of his philosophy, such as the unity of opposites, identity in difference, and finally his very dialectic, all being necessarily involved in any change.

Bohm's fascination with streams, whirlpools, vortices, and waterfalls readily comes to mind here, but also, likewise in Hegel, not only as a sort of retreat from the storms and troubles of life. One of the earliest experiences he had in the backwoods of his hometown mountains when he was twelve, a "sort of incident [that] impressed me so that it stuck in my mind", as Bohm recalled it, turned out particularly significant for his whole later rational thought.[171] The young Bohm had to cross a stream on stepping stones but found that impossible by a succession of overthought discrete steps. Instead, he realised that the best way to cross the stream is to become like the stream itself, that is, to trust his body and traverse it continuously in an unbroken fashion. The same intuitive experience of reality as 'an unbroken, undivided process of flow', a

Figure 4. *A Waterfall in a Rocky Landscape* (c. 1660), oil on canvas, by the seventeenth-century Dutch painter Jacob van Ruysdael, which greatly impressed and inspired Bohm as a masterful art depiction of dialectical processes of movement and permanence. From: National Gallery, London, UK, available at: https://www.nationalgallery.co.uk, public domain (CC BY-NC-ND 4.0).

phrase Bohm would abundantly use throughout the rest of his life, he had with natural phenomena like whirlpools and vortices in water and air, in which he was interested "already from watching them in the bathroom or somewhere else" at an early age and also from reading about tornadoes.[172] In particular, what struck the imagination of young Bohm was a coexistence of, on the one hand, the apparent relative constancy, independence, and stability of these phenomena but, on the other hand – at deeper levels – their rather violent and

153
See, e.g. Daniel F. M. Strauss, "Atomism and holism in the understanding of society and social systems", *Koers – Bulletin for Christian Scholarship* 73(2008) 2, pp. 187–205, doi: https://doi.org/10.4102/koers.v73i2.159; Michael Esfeld, "Atomism and Holism: Philosophical Aspects", in: J. D. Wright (ed.), *International encyclopedia of the social and behavioral sciences,* volume 2, Elsevier, Amsterdam 2015, pp. 131–135.

154
J. David Lewis, Andrew J. Weigert, "Social Atomism, Holism, and Trust", *The Sociological Quarterly* 26 (1985) 4, pp. 455–471, here p. 455, doi: https://doi.org/10.1111/j.1533-8525.1985.tb00238.x.

155
D. K. Simonton, "Creative Genius in Science", p. 264.

156
See Interview of David Bohm by Maurice Wilkins on 6 June 1986. The psychiatrist who was later to treat David Bohm for his own depressions believed that she had been misdiagnosed as schizophrenic and had, in fact, been suffering from manic depression (D. Peat, *The Infinite Potential*, p. 310).

157
Interview of David Bohm by Maurice Wilkins on 12 June 1986.

158
Ibid.

everlasting movement and change. Such experiences would gradually lead Bohm not only to the understanding that these particular phenomena exist "only in the flow as a recurrent pattern with stability",[173] but also to a belief that 'things' and 'objects' generally exist as "relatively stable and recurrent patterns in a universal flow or flux",[174] and consequently to the view of reality "not [as] a static object, but a flowing movement",[175] a view that necessarily must include an all-encompassing outlook at natural phenomena in their totality and wholeness. This 'watery imagery' of reality, and generally his imaginative temperament similar to that of Hegel, not only impressively marked his childhood and youth, during which he intuitively felt what he would later transcribe into the language of physics, but remained much alive in him throughout the rest of his life as an inexhaustible and lively inspiration for his work.

When thus, for example, in the 1960s Bohm started to examine more deeply the concept of order from a process philosophy perspective, motivated largely by his correspondence with the American artist Charles Biederman,[176] he increasingly became interested in art, and one of the paintings that particularly impressed and inspired him as a masterful art depiction of dialectical processes of movement and permanence was the painting "A Waterfall in a Rocky Landscape" of the seventeenth-century Dutch painter Jacob van Ruysdael (see Figure 4),[177] who, in the words of Goethe "delights, refreshes and revitalizes us by the wholeness of his inner and outward feelings".[178]

Another artist that struck Bohm's imagination was the nineteenth-century English painter Joseph Mallord William Turner – whose most praised work, interesting to mention, was the 1804 painting 'The Great Falls of the Reichenbach, a magnificent piece of art depicting Hegel's fascination and inspiration – with his "overwhelming passion" for the "power of light and the movement of water", which succeeded in giving the impression of a constantly rotating vortex within his paintings, a vortex of light, or of the violent motion of air and water that dissolves linear forms".[179] During the 1967 Bellagio Conference in Theoretical Biology, at which Bohm expounded in detail his 'process metaphysics',[180] waterfalls, together with other phenomena like clouds or flames of fire, were also key illustrations of the idea that

> "… the universe should not be regarded as made up of 'things' but of a complex hierarchy of smaller and larger flow patterns in which the 'things' are invariant of self-maintaining features of the flow."[181]

Even his most abstract concepts, like the qualitative infinity of nature, which is the key idea of his 1957 book *Causality and Chance in Modern Physics*, and which is commonly thought to have arisen out of his former Marxist discourse during his stays in Brazil and Israel 1952–1955,[182] seem to have, in fact, come also through an active imagination of the similar kind. As Bohm recalled, he already got the idea "implicit in some of my feelings before that in America", and this time his inspiration came from the animation film *The Emperor's Nightingale* (*Císařův slavík*), a Czech stop-motion puppet animation film made in 1949 by the acclaimed animator Jirí Trnka, based on Hans Christian Andersen's fairy-tale *The Nightingale*.[183] A scene that particularly left an impression on Bohm was the night scene with an old fisherman in a boat floating on a stirring river reflecting the surrounding (Figure 5), suggesting to him "the idea of an infinite depth to the water, some infinite subtlety of movement", and of "matter being infinite inwardly", which was exactly that

"what I was trying to say in the book", and which "has sort of stayed with me since then".[184]

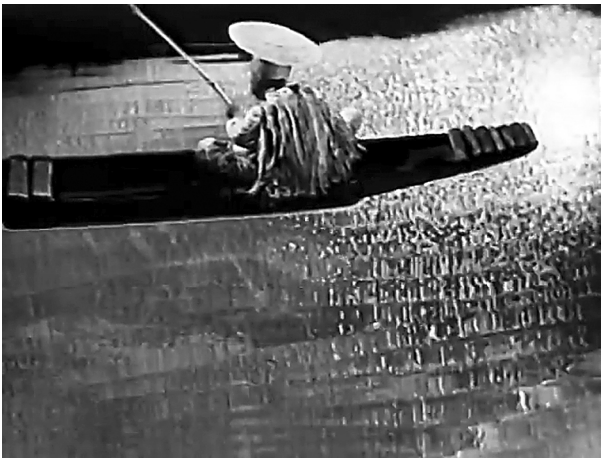

Figure 5. A still from the 1949 Czech stop-motion puppet animation film *The Emperor's Nightingale* (*Císařův slavík*) by the acclaimed animator Jirí Trnka that made a great impression on Bohm and influenced his view on the 'qualitative infinity of nature'. ArtHouse Media, www.youtube.com, public domain.

The strong impression this motif left on Bohm is understandable not only in the sense of being inspiring for his physical and philosophical insights but also since the whole movie might be seen as a strikingly precise adaptation of his own early psychological development and sentiment that have strongly influenced his whole later intellectual life. In particular, not only the movie

159
Ibid.

160
Interview of David Bohm by Maurice Wilkins on 7 July 1986, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-3 (accessed on 31 July 2022).

161
T. Pinkard, *Hegel*, p. 54.

162
Hegel to Karl Joseph Windischmann, 27 May 1810, in: G. W. F. Hegel, *The Letters*, p. 561. Contrary to Bohm's, Hegel's parental home was psychologically a relatively safe place for the young Hegel, except for the estrangement with his father, whom he rarely mentioned in his letters and diaries. For Hegel's mental health and general psychological characterization, see: Gustav E. Müller, *Hegel. Denkgeschichte eines Lebendigen*, Francke Verlag, Bern – München 1959, pp. 169–170; Arnold Künzli, "Prolegomena zu einer Psychographie Hegels", in: Gerd-Klaus Kaltenbrunner (ed.), *Hegel und die Folgen*, Verlag Rombach, Freiburg 1970, pp. 37–66; H. S. Harris, *Hegel's Development*, p. 265; B.-A. Scharfstein, *The Philosophers*, pp. 230–242. Scharfstein offers the most exhaustive and comprehensive analysis of the psychology of Hegel's personality as related to his philosophy thus far.

163
Hegel to Nanette Endel, 2 July 1797, in: G. W. F. Hegel, *The Letters*, pp. 59–60.

164
Ibid., p. 612.

165
Ibid., p. 510.

166
The original German version of this journal entry can be found in: Karl Rosenkranz, *Georg Wilhelm Friedrich Hegel's Leben*, Duncker und Humblot, Berlin 1844, pp. 470–490. Its partial English translation can be found in: W. Kaufman, *Hegel*, pp. 307–310.

167
W. Kaufman, *Hegel*, p. 309.

168
Ibid., p. 307.

is plotted around an anxious and solitary boy living isolated from the outside world with uninterested but overprotecting elderly caretakers in the company of mechanical toys, and who thus escapes into the world of fantasy and dreams only to find real peace of mind in the real world of nature,[185] but is also characterised by strong images of life contradictions, like inner vs. outside, individual vs. societal, mechanistic and artificial vs. natural, and many others that bothered Bohm from an early age, all of which are in the movie – that could, in a sense, be considered one of the most suggestive 'psychobiographies' of Bohm thus far – finally resolved within a context of water imagery, common both to Bohm and Hegel.

Of course, just like in the case of the shared social propensities of Hegel's and Bohm's development, one could here similarly object that the described traits of Hegel and Bohm, primarily their affection for nature and imagination as a retreat from anxiety, which then supposedly played a pivotal role in modulating similar social conditions they were exposed to during their early development into similar cognitive outcomes later in their lives, are also in no way unique to Hegel and Bohm, and that these, being true for probably a great majority of people, can hardly be an indicator of their similar temperaments let alone a pivotal factor in the development of their shared worldviews. Such an objection, however, would lose from sight, first, that there exist a vast variety of regressive, repressive, and compensatory coping strategies with anxiety in humans, including the cognitive ones,[186] with the retreat to nature and imagination not being unique, and second, that one such particular retreat does, in fact, have certain common psychological and cognitive correlates. As modern studies plausibly demonstrate, not only that there exist both cross-cultural and individual differences in the so-called analytic and holistic styles of thinking[187] but these differences are also tightly related to certain emotional, temperamental, and personality traits. In particular, as demonstrated in one most recent study, which examined the relationship between holistic thinking and emotional variability across environments in a wider context of self-environment relation, stronger holistic thinking is associated with stronger connectedness and greater affective affinity toward nature.[188] This empirically found relation, however, should not come as a surprise already in a historical perspective, in which the "Romantic veneration of nature" that took nature as "inspiration or refuge" and "facilitated their search for the infinite" was the general 'psychology of Romanticism',[189] and thus neither in the case of Hegel's and Bohm's shared holistic thinking styles, considering their shared Romantic roots, as also demonstrated in this article.

Conclusion

When in 1961 a small symposium "Quanta and Reality" on the physical and philosophical implications of quantum mechanics was held under the auspices of the BBC Third Programme in London, a fierce conversation between David Bohm, then at Birbeck College, and Maurice Pryce, head of the Physics Department at Bristol, vividly summarised all the hardship Bohm was facing throughout his career. When thus Pryce, a distinguished theoretical physicist, not only acclaimed that "my philosophy is to avoid philosophy", preferring "always to do my physics by avoiding this kind of question on the grounds that it is not a question of physics but a question of philosophy", but also feared that in fact "there would be chaos in the way that we look at physics" if

we entertain philosophical ideas in the world of physics,[190] he was describing just that common shut up and calculate "stupefying spirit of formalism and pragmatism in physics" Bohm had "a passionate desire to fight" already as a young physicist.[191] For Bohm, it was never questionable there would be no "chaos if everybody considered his philosophical ideas" but quite the contrary

169
Ibid., p. 308.

170
Ibid., p. 307.

171
Interview of David Bohm by Maurice Wilkins on 6 June 1986.

172
Interview of David Bohm by Maurice Wilkins on 12 June 1986.

173
Interview of David Bohm by Maurice Wilkins on 16 April 1987, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-12 (accessed on 31 July 2022).

174
Ibid.

175
Interview of David Bohm by Maurice Wilkins on 30 January 1987.

176
See: P. Pylkkänen (ed.), *Bohm-Biederman Correspondence. Volume I: Creativity and Science*.

177
D. Peat, *The Infinite Potential*, p. 235. Peat mentions Salomon van Ruysdael as an author of the painting, but this is not right, although Salomon (Jacob's uncle) was also a great Dutch landscape painter. Bohm came in contact with Ruysdael's painting through Basil Hiley, who first visited Tate Gallery to see Biederman's work but remained disappointed. However, later on, when Hiley "went to the National Gallery and saw the Ruysdael painting and even brought a postcard print of it", he was struck by the painter's skill "to give the illusion of movement so strikingly" (Basil Hiley e-mail to the author, 11 December 2020).

178
Johann W. Goethe, "Ruisdael the Poet (1816)", in: John Gage (ed.), *Goethe on Art*, University of California Press, Berkeley – Los Angeles 1980, p. 215.

179
D. Bohm, D. Peat, *Science, Order, and Creativity*, p. 168.

180
D. Bohm, "Some remarks on the Notion of Order".

181
John Platt, "Hierarchical Growth", *Bulletin of the Atomic Scientists* 26 (1970), pp. 2–4, 46–48.

182
The key idea of Bohm's conception of the 'qualitative infinity of nature' is that in nature there are neither unchangeable ultimate elements nor fixed ultimate laws describing them, i.e. that nature is ontologically and our science epistemically inexhaustible (see: D. Bohm, *Causality and Chance in Modern Physics*, Ch. 5). The conception came as a result of Bohm's reconsideration of the concepts of causality and chance during the first half of the 1950s after he felt that his 1952 work on hidden variables was misunderstood as a return to the strict mechanical determinism of classical physics, which resulted with a kind of dialectical synthesis of causality and chance having now been taken on the same ontological foot. Thus, for example, regarding the heated discussions about the acausal character of quantum theory debated among physicists since the late 1920s, Bohm considered that no physical law is either exclusively deterministic or exclusively statistical, but that what seems to be deterministic at one level might be considered statistical at the other of reality, or vice versa (see: B. Kožnjak, "The missing history of Bohm's hidden variables theory", p. 91). The very conception was also just another opportunity for Bohm's hope of drawing social implications from physics. As he wrote in a 1953 letter, "human nature is no different from Nature in general; for according to the ∞ of levels, all properties can be altered with sufficient changes in conditions", so that "the ∞ of levels is an integral part of a better view of Nature in general, and of human nature in particular" (Bohm to Miriam Yevick, 21 April 1953; in: C. Talbot, *David Bohm*, p. 331). In other words, just like there are no fundamental particles but only matter containing an infinity of qualitatively different and alterable levels, there are also no "ultimate 'individuals', which are 'fundamental' in the sense that their character is unalterable,

"that chaos will occur if everybody has philosophical ideas without noticing that they are philosophical".[192] Moreover, throughout his life, Bohm believed that "philosophy can guide us, not only in helping us to criticize our previous ideas, to know where they came from and to follow their evolution and development but also in another way" by leading to new concepts and research directions.[193] As demonstrated in this article, Hegel's philosophy undoubtedly represented the main and stable source of Bohm's lifelong inspiration both for his physics and his philosophical reflections upon it. But, Bohm's embrace of Hegel was only partially motivated by his belief that his thought offers a plausibly strong and sufficiently wide interdisciplinary bridge between science and philosophy. Partially, it was also motivated by the alignment of the Hegelian perspective with one of Bohm's most general convictions, namely, that there are, broadly speaking, three main dimensions of the human being – individual, societal and cosmic – each of which must be fulfilled to have a satisfied human being and a just society,[194] in light of which Bohm's other philosophical influences necessarily turned out disappointing and ephemeral.

Bohm's embrace of Marxism in the late 1940s and early 1950s reflected Bohm's strong communitarian feeling he had from an early age, and

and their existence eternal" (Bohm to Hanna Loewy, not dated, probably in early 1952; in: C. Talbot, C. Talbot, *David Bohm*, p. 123). As noticed, it is commonly assumed that Bohm "may have been inspired by the idea of the inexhaustibility of the electron, which he picked up from Lenin's works while still at Princeton" (O. Freire Jr., *David Bohm*, p. 108), and that he expanded this Lenin's idea into this idea into the concept of *qualitative infinity of levels* (C. Talbot, *David Bohm*, p. 27). For historical details of the concept of 'inexhaustible electron', see: Mario Bunge, "The Inexhaustible Electron", *Science & Society* 14 (1950), pp. 115–121.

183

It is not known where and when exactly Bohm saw the movie, which was brought in 1951 to the United States by the American distribution company Rembrandt Films with new English narration by the legendary Boris Karloff, and was premiered on 12th May 1951 at the Sixtieth Street Trans-Lux Theater in New York; see: Bosley Crowther, "The Screen in Review; 'Emperor's Nightingale', Fantasy Made in Czechoslovakia, at 6th St. Trans-Lux", *The New York Times*, 14 May 1951.

184

Interview of David Bohm by Maurice Wilkins on 22 December 1986, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-6 (accessed on 31 July 2022).

185

As already noticed, Bohm grew up in an insecure, chaotic, and at times violent family climate of constant quarrels between his disinterested parents, mainly due to his mother's mental illness and his father's egotism, but at the same time, his mother compulsively and openly displayed a pathological fear for the health of the young Bohm and doubt in his physical capabilities, which resulted both with his bodily clumsiness and hypochondria, a trait that that will accompany him for the rest of his life. As a retreat, the young Bohm was not only escaping into nature fantasy but he also, likely as compensation for the imputed lack of practical skills, developed a passion for making mechanical toys and inventions. See: Interview of David Bohm by Maurice Wilkins on June 6 1986, *American Institute of Physics*. Available at: www.aip.org/history-programs/niels-bohr-library/oral-histories/32977-1 (accessed on 31 July 2022). Also: D. Peat, *The Infinite Potential*, pp. 9, 18–19.

186

See: B. Kožnjak, "Kuhn Meets Maslow", esp. pp. 261–267.

187

See, e.g. Richard Nisbett *et al*., "Culture and systems of thought: holistic versus analytic cognition", *Psychological Review* 108 (2001), pp. 291–310; Incheol Choi *et al*., "Individual Differences in Analytic Versus Holistic Thinking", *Personality and Social Psychology Bulletin* 33 (2007), pp. 691–705.

188

Joanne Schneider, *The Age of Romanticism*, Greenwood Press, London 2007, pp. 71, 72.

189

David Vallins, *Coleridge and the Psychology of Romanticism. Feeling and Thought*, Macmillan Press, London 2000.

consequently a hope that one such philosophy might provide a unique historical opportunity for the fulfillment of the social dimension of man. However, after Khrushchev's speech on Stalin's crimes in February 1956 at the 20th Congress of the Communist Party of the Soviet Union and the Soviet invasion of Hungary in November the same year, Bohm became completely estranged from Marxism,[195] since he never imagined overcoming the societal fragmentation as an affirmation of the totalitarian rule of power, nor the affirmation of 'holism' as the loss of individual freedom. After all, his early work on plasma in the late 1940s, which is said to have reflected his Marxist commitments, was done under a conviction that "electrons in plasma and in metals [are] capable of combining collective action with individual freedom, a combination that he pursued in his personal and political life".[196] Then, disappointed in Marxism, which betrayed the individual, distorted the society, and completely ignored the cosmic dimension of man as "the human relationship to the whole, to the totality of *what is*",[197] Bohm started to follow more spiritual paths. However, after a short period of time being involved with the esotericism of Gurdjieff and Ouspensky, and a relatively long period with Krishnamurti from the early 1960s up to the late 1970s, Bohm realised not only that these esoteric perspectives completely downplayed the social dimension of man but also that they practiced a rather dogmatic and cultish individualism, which compromised also the very cosmic dimension they were claiming to had heartfully jointly embraced. [198] Bohm never intended to be a cult figure, neither as a follower nor a guru, and certainly not a 'mystic' in the usual sense of the word, so the whole spiritual experience was for him a bitter end. Nevertheless, during all these decades, Bohm never ceased to read and think about Hegel's philosophy, which never disappointed him. Moreover, Hegel's reconciliation of individualism and communitarianism, and particularly individual freedom with the authority of the state,[199] together with his holism linking the individual,

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"A Discussion: Professor Maurice Pryce, F.R.R., and Professor David Bohm", in: Stephen Toulmin (ed.), *Quanta and Reality. A Symposium*, American Research Council, Larchmont (NY) 1962, pp. 61–81, here p. 70.

191
See footnote 65.

192
Ibid.

193
Ibid.

194
See: D. Bohm, D. Peat, *Science, Order, and Creativity*, pp. 248–254.

195
See, e.g. O. Freire Jr., *David Bohm*, pp. 105 –107.

196
A. Kojevnikov, "David Bohm and collective movement", p. 192.

197
D. Bohm, D. Peat, *Science, Order, and Creativity*, p. 251.

198
Although in the beginning Bohm seems to have been almost mesmerized by Krishnamurti, a picture that is still reinforced in popular culture, by the passage of time he was becoming more and more disappointed with his teachings and persona. In the Afterword included in the paperback edition of his biography of Bohm, David Peat reflected upon letters exchanged between Bohm and Fritz Wilhelm, a young physicist also attracted to Krishnamurti's teachings, he had been given access to in the meantime. As put by Peat, these letters "paint a very different picture and one in which I was not fully aware when I came to write this biography", and provide "a deeply considered criticism of the whole body of Krishnamurti's teachings and the limitations Bohm had come to see in the man himself". – D. Peat, *The Infinite Potential*, p. 323.

199
The mentioned distinctive characteristic of Hegel's philosophy (see Sec. 4), namely, the intention of "bringing man back home again", both in the sense of "being at home with oneself" and "being at home with oneself in otherness" is basically Hegel's general

the societal, and the universal or the cosmic, including also the very mind as an essential part of this larger story, was becoming an increasingly attractive position for him over time as his disappointment in the philosophical alternatives grew.

However, the most decisive part of Bohm's passionate embrace of Hegel's philosophy is perhaps to be found in its resonance with Bohm's psychological sentiment and temperament. As also demonstrated in detail in the article, Bohm's and Hegel's shared abhorrence of fragmentation and adherence to wholeness was not only due to similar social settings of their early developments but also to their pivotal temperamental commensurability, characterised primarily by their intuitive-thinking personality type strongly relying on imagination but never losing sight of strict logical analysis. Although this somehow runs against a common view of Hegel as a 'cold thinker', Hegel not only discussed the importance of imagination (*Einbildungskraft*) to speculative thinking[200] but had also employed the very imagination abundantly in his writings, and not only in his private letters and journals. Moreover, Hegel's *Phenomenology of Spirit*, commonly regarded as an emotionless discursive work, is in fact "a work of vast imaginative and rational structure, a colossus without equal in modern philosophy",[201] of which the archetypal Heraclitean water imagery – widely known by the phrase 'it is not possible to step twice into the same river', later rendered as 'everything flows' (*panta rhei*) – was an essential part.[202] The reasons for Bohm's endorsement of such a philosophical concession to imagination should then hardly come as a surprise. For Bohm, namely, "the powers of imagination actually go far beyond" the ability to make mental images and include "the creative inception of new forms, hitherto unknown", experienced "not only as visual images but also through all sorts of feelings, tactile sensations, and kinesthetic sensations, and in other ways that defy description".[203] Furthermore, Bohm firmly believed that imagination is "part of reality", moreover, that it is "essentially the creative source of reality",[204] and even saw the implicate order – his most

definition of freedom. For Hegel's treatment of the relationship between the individual and society see, e.g. Uchenna Osigwe, "The Individual, the State, and Political Freedom in Hegel", *Hegel-Jahrbuch* (2008), pp. 97–101.

200
See, e.g., Jennifer A. Bates, *Hegel's Theory of Imagination*, State University of New York Press, Albany 2004.

201
Charles H. Candler, *Hegel's Recollection. A Study of Images in the* Phenomenology of Spirit, State University of New York, Albany 1985, p. ix.

202
Heraclitus is yet another important link between Bohm and Hegel, both of whom highly appreciated the ancient philosopher, commonly considered the first Western 'holist' and 'dialectician'. As put by Hegel, "there is no proposition of Heraclitus which I have not adopted in my Logic". – G. W. F. Hegel, *Lectures on the History of Philosophy*, vol. I, p. 279. Bohm often referred to Heraclitus as an inspiring historical precursor of the idea of "undivided wholeness in flowing movement"; see, e.g. D. Bohm, *Causality and Chance in Modern Physics*, p. 153; D. Bohm, *Wholeness and the Implicate Order*, p. 61; also, numerous references to Heraclitus in Bohm's *AIP* interviews with Maurice Wilkins.

203
D. Bohm, D. Peat, *Science, Order, and Creativity*, p. 262.

204
Interview of David Bohm by Maurice Wilkins on 12 June 1986.

205
R. Weber, "David Bohm", p. 34.

206
Interview of David Bohm by Maurice Wilkins on 6 March 1987.

mature and developed Hegelian idea – "as a new form of imagination",[205] best explainable as an analogy put, once again, just in – Hegelian terms. In Bohm's own words:

"You see, like I was explaining with Hegel, the idea is first implicit only in itself and then it unfolds, it spreads out, in the imagination or in some other form like writing or painting. It becomes explicit, unfolded."[206]

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Boris Kožnjak

Vodopadi, društva i naravi – fragmentacija i cjelovitost u životu i radu Davida Bohma i Georga Wilhelma Friedricha Hegela

Sažetak

U ovom članku analiziram dosad većinski zanemarene društvene i psihologičke korijene filozofije cjelovitosti u Davida Bohma i Georga Wilhelma Friedricha Hegela. Bohmu je Hegel bio najsnažniji filozofijski utjecaj kroz njegov zreo intelektualni život, međutim, kako se dokazuje u članku, Bohmovo nepodnošenje fragmentacije i njegova naklonost prema cjelovitosti, značajno odražena u njegovoj fizici i filozofiji znanosti, ustvari je ostvarenje posebnih društvenih sklonosti i psihologičkih odrednica njegova ranog emocionalnog i intelektualnog razvoja za koji je Hegelova filozofija bio ključni razumski katalizator u kasnijem životu. Društvene sklonosti i psihičke odrednice Bohmova ranog razvoja nadalje se dokazuju kao upečatljivo slične onima koje su mladog Hegela navele na nošenje s pojmom cjelovitosti tijekom njegova života. Ovaj članak također donosi biografske dokaze za Bohmovo cjeloživotno zanimanje za Hegela te analizira stanje učenosti o njegovu hegelijanizmu, prirodi Hegelove filozofije kako se odražava u Bohmovu radu i razloge za nekako neočekivano disciplinarno zanemarenje ključnog utjecaja Hegelove filozofije na Bohmovu filozofiju.

Ključne riječi

David Joseph Bohm, George Wilhelm Friedrich Hegel, fragmentacija, cjelovitost, sociodruštveni milje, ćud, mistika, spekulativna filozofija, imaginacija

Boris Kožnjak

Wasserfälle, Gesellschaften und Temperamente – Fragmentierung und Ganzheit im Leben und Werk von David Bohm und Georg Wilhelm Friedrich Hegel

Zusammenfassung

In diesem Aufsatz analysiere ich die bisher weitgehend außer Acht gelassenen gesellschaftlichen und psychologischen Wurzeln der Ganzheitsphilosophie bei David Bohm und Georg Wilhelm Friedrich Hegel. Hegel war Bohms stärkster philosophischer Einfluss sein gesamtes reifes intellektuelles Leben hindurch, allerdings, wie in dem Aufsatz untermauert wird, war Bohms Abneigung gegen die Fragmentierung, zusammen mit seinem Faible für Ganzheit, das sich anschaulich sowohl in seiner Physik als auch in seiner Wissenschaftsphilosophie widerspiegelt, tatsächlich die Verwirklichung der spezifischen sozialen Neigungen und psychologischen Determinanten seiner frühen emotionalen und intellektuellen Entwicklung, für die Hegels Philosophie später in seinem Leben ein ausschlaggebender rationaler Katalysator war. Diese sozialen Neigungen und psychologischen Determinanten von Bohms früher Entwicklung erweisen sich ferner als auffallend ähnlich zu jenen, die auch den jungen Hegel veranlassten, sich sein ganzes Leben lang mit dem Begriff der Ganzheit auseinanderzusetzen. Der Artikel bringt auch die biografischen Beweise für Bohms lebenslanges Interesse an Hegel und analysiert den Status der Gelehrsamkeit bezüglich seines Hegelianismus, der Natur von Hegels Philosophie und wie sie in Bohms Werk zum Ausdruck gebracht wird sowie die Gründe für die irgendwie unerwartete disziplinäre Vernachlässigung des entscheidenden Einflusses von Hegels Philosophie auf Bohm.

Schlüsselwörter

David Joseph Bohm, George Wilhelm Friedrich Hegel, Fragmentierung, Ganzheit, soziokulturelles Milieu, Temperament, Mystizismus, spekulative Philosophie, Imagination

Boris Kožnjak

Cascades, sociétés et tempéraments – fragmentation et totalité dans la vie et l'œuvre de David Bohm et de Georg Wilhelm Friedrich Hegel

Résumé

Dans cet article, j'analyse les racines sociales et psychologiques, jusqu'à présent grandement négligées, de la philosophie de la totalité chez David Bohm et Georg Wilhelm Friedrich Hegel. Hegel a exercé une grande influence sur Bohm durant sa vie intellectuelle mature. Toutefois, comme il est montré dans cet article, son aversion pour la fragmentation et l'affection qu'il porte pour la totalité, qui se reflète de manière éminente autant dans sa physique et sa philosophie de la science, est en réalité la réalisation des tendances sociales particulières et déterminations psychologiques dans la phase initiale de son développement émotionnel et intellectuel, sur laquelle la philosophie de Hegel a joué le rôle crucial de catalyseur rationnel plus tard sa vie. Ces tendances sociales et ces déterminations psychologiques du développement initial se révèlent plus tard être similaires de manière frappante à celles qui ont mené le jeune Hegel à s'engager au côté du concept de totalité durant sa vie. Cet article offre également les preuves biographiques de l'intérêt permanent de Bohm pour Hegel et analyse l'érudition de son hégélianisme, la nature de la philosophie de Hegel ainsi qu'elle se reflète dans l'œuvre de Bohm, et la raison, d'une certaine manière inattendue, du désintérêt disciplinaire de l'influence cruciale de la philosophie de Hegel sur Bohm.

Mots-clés

David Joseph Bohm, George Wilhelm Friedrich Hegel, fragmentation, totalité, milieu socioculturel, mystique, philosophie spéculative, imagination