



**Review of *Material and Mind* by Christopher Bardt, The MIT Press. 2019. 373 pp.**

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*Material and Mind* is an ambitious interdisciplinary project in which Christopher Bardt, Professor of Architecture, examines the links between imagination, materials, and the mind. The fundamental question explored in his book is: “how are ideas, the imagination, and creativity influenced by and intertwined with physical material?” (5). Bardt argues that the influence that materials and our physical surroundings have on our minds has previously been underestimated or completely ignored. Thinking has been strongly connected with language, while the role of material has been confined to the representation of these preformed ideas. Bardt explains that ‘mind,’ as “the faculty of imagination” has been divorced from our physical senses, and that this does not account for how working with materials influences our imagination.

Bardt sets out to prove his thesis that “working with physical material generates thought, imagination, and creative insights” (22) by outlining a historical examination of this relationship. He draws on contemporary

as well as historical examples to explore themes across twelve chapters. This mixture of old and new demonstrates how the material world has been and continues to be deeply influential in creative moments and processes. Beginning at the advent of language and tools, he outlines the effects making has on thinking, remembering, and visualizing, and explores visual and conceptual metaphors— “we think through materials” (197). Bardt, then, moves via the renaissance’s invention of perspective through multiple examples of art works and architectural constructions where materials have influenced the design process. Finally, he concludes the book in our current time where materiality has taken a back seat to digital technology.

Andy Clark and David J. Chalmer’s concept of “The Extended Mind” (1998) and Francisco J. Varela, Eleanor Rosch, and Evan Thompson’s Enactive Mind-theory (1991) are foundational for Bardt’s project. These theories from the cognitive sciences emphasise how the mind does not function in isolation but in a process of exchange with the physical and material. Through these concepts, Bardt demonstrates how mind and matter are constantly intertwined in processes of remembering as well as designing. Whilst material is often discussed as something *acted* on, Bardt outlines how materials and media also have *resistance*, and it is this resistance that he argues “wakens the imagination” (189) and brings forward a conversation between mind and material. To support his thesis, Bardt presents a wide range of historical examples as well as personal anecdotes to demonstrate the many times, and ways, in which materials have had a say in design processes. As an example of the give and take relationship between mind and material, Bardt lists the car industry’s design process. Despite access to enhanced digital technology, car manufacturers still construct hand-sculpted clay models for new car designs. As Bardt writes, “both designers and modelers speak of the ‘soul’ and ‘transmission of emotion’ as key ingredients

of car design” that they cannot achieve with 3D software alone (15).

Bardt also analyses projects by various architects, for example the influence of ‘the hand’ on Ronchamp chapel by Charles-Édouard Jenneret (1887-1965). Although the finished chapel is not hand-shaped, Bardt takes us through the layers of the architect’s design process addressing the metaphorical and metaphysical bonds between the architect’s mind and hand. One of the buildings Bardt examines at length is Ludwig Mies van der Rohe’s Tugendhat House (Brno, Czech Republic, 1930). Bardt traces the impact of Mies’ charcoal sketches, and his use of thick lines for the top floor and thin lines for the bottom floor (212-13). Bardt views them as an example of how Mies “understood that thought emerges through media” (213). The most interesting part of Bardt’s analysis is “the onyx wall” (216-22). The stone wall transmits light and Bardt claims that “the wall is reduced to the purely elemental and, like fire, gives rise to material imagination” (219). He connects Mies’ onyx wall to the cave paintings of hunted animals that he discussed in chapter two as a “marked membrane [which] fuses subject with object” (39). Although Bardt is careful not to overextend this comparison, it is a thought provoking one that emphasises how, despite changing times, some material conditions and inspirations are solid, albeit partially transparent. He claims that these two walls “collapse distance—between human and animal worlds in the former, and between self and modernity in the latter” (222).

In the final chapters, Bardt explores the dangers of leaving embodied thinking behind in the adoption of new digital technologies and the need to “differentiate between resistance and stimulation” (335). Bardt argues that it is in the material resistance that creativity is sparked. Stimulation, however, is a passive state for both body and mind: “being stimulated is like following an instruction, which is not the same as acting on one’s own” (335). Bardt asks if we can “learn without the involvement of our hands and their participation in our physical

material and Umwelt?” (336). He reaches the conclusion that students of architecture need to learn by working with materials and their hands as well as with digital technology.

Bardt’s *Material and Mind* is an inspiring read that allows us to see the agency and potential in materials and the interactions we have with them. Bardt takes an interdisciplinary approach, drawing on, for example, archaeology, neuroscience, and philosophy as well as art history and poetry. He argues that “only such a broad [...] approach can reveal how material and mind interact through surrogates such as metaphor, representation projection, analogues, tools, and models.” (3-4). Bardt’s interdisciplinary approach paves the way for readers to explore this subject further in their own discipline, underlining the utility of this work across fields far beyond architecture and design.

This book is a love letter to the hands-on design process, but more than that, through emphasising the intertwined relationship between internal mind and external world it calls attention to how we are not only actants but are constantly acted upon and deeply influenced by the materials around us. In the context of our current climate crisis, Bardt’s book foregrounds the importance of thinking with and through our hands and bodies, and, perhaps, by extension, the earth.



Charles-Édouard Jenneret, Ronchamp chapel