

# Inside mathematics: mystery vs. problem

David Wagner<sup>1</sup>

<sup>1</sup>University of New Brunswick, Canada; dwagner@unb.ca

*Keywords: Assessment, new materialism, mystery, problem solving.*

As the impact of humanity's destruction of the earth and its bodies becomes increasingly obvious, I find new materialist scholarship necessary. It compels awareness of connections among human and other bodies. But I have questions of the theory, which I hope to discuss in CERME conversations.

Existentialist philosopher Gabriel Marcel (1952/2009) drew a distinction between mystery and problem. His description of mystery aligns with my reading of the theorization of new materialism because it points to interconnection and the dangers of technocracies' "spirit of abstraction":

In contrast to the world of the problematic which [...] is wholly apart from me and in front of me, the world of mystery is a place where I find myself committed, and, I would add, not partially committed, not committed in regard to some determinate and specialized aspect of myself, but committed as a whole [person] in so far as I achieve a unity which, for that matter, by its very definition, can never be grasped in itself, grasped as something apart from me. (pp. 40-41)

I find that applications of new materialism in mathematics education mostly fit the rubric of problem more than mystery, using Marcel's distinction: the problems addressed are outside of the people acting with/on them. For example, Liz deFreitas and Nathalie Sinclair (2014) wonder, "What happens to our understanding of learning when we consider the cube itself as not merely passive, but actively involved in the assembling of meaning?" (p. 24). The mathematics students' interactions with the cubes will impact them only for a short while. In this way, the problem is outside of them. Their bodies engage with the cubes but the scope of the problems is local. Students touch the mathematics in the moment, but this mathematics does not connect with their lives outside that space. I also find new materialism writ large obsessing with corporeal connections—our selves in relation to bodies and things, often described as thing-power (e.g., Bennett, 2010). I love this embrace of the five senses, but what about the sense of being trapped or stuck? This feeling can distract from the other senses. I find some work on body politics in mathematics education—considering the experiences of learners with differing sensory abilities (e.g., Healy & Fernandes, 2011).

I consider what Marcel might call a mystery—where the student has stakes and hopes in the problem. I think of mathematical systems active in school life that are not usually played with or discussed in math classrooms: assessment practices present a gripping example. The gatekeeping power of mathematics assessment mediates the access students' bodies will have to positions and resources throughout their lives. My own experience in math classes gave me a growing sense of confidence that my self/body would have wide access, but others do not have this experience.

I also think of the practicalities and ethics of mathematics teachers engaging with students on a 'mystery' like quantified assessment. Discussion of grades as indices may help students understand other indices, such as the Human Development Index or the body mass index. The discussion may guide students in understanding how mathematization can crudely reduce complex phenomena to

simple numbers, and, on the other hand, how it might expose need for real change. The mediation of this index that grips students and reaches forward to control their future opportunities also has ethical challenges. How do students respond to dialogue and play with this powerful mathematics led by the very person that enacts that power, their teacher? This dynamic may be at play with any ‘mystery’.

I suggest that the field of mathematics education needs to develop ways to mediate the way students live *within* and *through* mathematical systems (I have called this diamathematics in some recent invited lectures). This idea emerged from my work on students being subject to mathematics (Wagner, 2022), rather than subjects who do mathematics. I very recently found Marcel’s concept of mystery, finding alignment with my thoughts on subjectivity and on new materialism’s refusal to separate oneself from the materials in context—relational and physical. This motivates the dialogue I wish to have with our field’s leaders in new materialism.

Although work on and through mathematics that implicates us complicates the relationships of the people in dialogue—e.g., the power imbalances among people talking about the mathematics that is gatekeeping the futures of the people in the dialogue—I argue that maintaining mathematics as problem-based, in Marcel’s sense, fails to accept the responsibility to see mathematics as it acts in the world, acting with and through us. While I find much of the new materialist scholarship focused on sensuous connections, I recognize that some of the work tries to address the pains of interaction/intra-action. Bronwyn Davies (2021) described the centrality of *recognition* in our vital engagement with things: one of its aspects is *recognition as dispossession/dis-recognition*: “The reiterated assemblage that possesses, and makes a safe space for those who possess and are possessed, denies that safe space to others, dispossessing them, denying them recognition as human with its terms” (p. 95). Davies noted that “Recognition is a concept not much loved by new materialism philosophers because of its strong connection with identity politics” (p. 87). This sense of *recognition*, especially with her promotion of *creative relationality* (or *response-ability*) is akin to Marcel’s (1964) promotion of *disponibilité*—a radical openness. Awareness of our connections with things and others in our communities of action compel us to be available (*disponible*) for action in *response* to the flow of activity in the community—a flow in which we play a part.

## References

- Bennett, J. (2010). *Vibrant matter: A political ecology of things*. Duke University Press.
- Davies, B. (2021). *Entanglement in the world’s becoming and the doing of new materialist inquiry*. Routledge.
- De Freitas, E., & Sinclair, N. (2014). *Mathematics and the body: Material entanglements in the classroom*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139600378>
- Healy, L., & Fernandes, S. (2011). The role of gestures in the mathematical practices of those who do not see with their eyes. *Educational Studies in Mathematics*, 77(2–3), 157–174. <https://doi.org/10.1007/s10649-010-9290-1>
- Marcel, G. (1964). *Creative fidelity* (R. Rosthal, Trans.). Farrar, Straus.
- Marcel, G. (1952/2009). *Man against mass society* (G. Fraser, Trans.). St. Augustine’s Press.
- Wagner, D. (2022). Subject to mathematics. *For the Learning of Mathematics*, 42(1), 35–39.