Giorgio Agamben. *What is Real?* Trans. Lorenzo Chiesa. Stanford University Press year. 88 pp. $55.00 USD (Hardcover ISBN 9781503606203); $16.00 USD (Paperback ISBN 9781503606210).

In his recent book *What is Real?,* Giorgio Agamben uses the 1938 disappearance of the famed Italian quantum physicist Ettore Majorana within the broader ontological implications of that scientific project. Namely, if quantum mechanics describes a world where reality dissolves into probability, then how can we hope to approach the underlying meaning of the world? In a question, what is real?

While Agamben's works have frequently featured obscure historical figures such as the *homo sacer*, frequent readers of Agamben will notice a trend since the conclusion of the Homo Sacer project towards shorter, more focused interventions on these particular topics, often quickly moving from obscure minutiae to broad philosophical reflection. *What is Real?* is exemplary in this respect, including the unexpected tale of Majorana and review of the rise of probability theory alongside the more familiar discussion of the importance of potentiality to Aristotelian metaphysics. With the rise of quantum social theory, this last discussion linking Aristotelian metaphysics to quantum mechanics is sure to stand as an oversized contribution from Agamben's thin volume. Frequent readers of Agamben will surely delight in the novel exploration of probability, as well as Agamben's first public (albeit limited) engagement with the work of Simone Weil.

The most direct engagement of the text is the curious tale of Majorana. Though the names of his mentors and collaborators are recognizable beyond the field of quantum physics—including Enrico Fermi, Werner Heisenberg, and Niels Bohr—outside of his homeland, Majorana's legacy is largely confined to theoretical and mathematical physics (where his name appears as a prize, equation, and as a type of oscillator, fermion, and sphere). Indeed, though the English translation lacks a subtitle, Agamben's focus on Majorana's story is found in the original Italian title: *Che cos'è Reale? La Scomparsa di Majorana*. The key term in this typically Agambenian play on words (*scomparsa*) means both 'disappearance' and 'passing away,' and the biographical excursus that introduces the work outlines the curious case of the young physics prodigy who disappeared after leaving three contradictory letters about his whereabouts.

For Agamben, the uncertainty surrounding the disappearance of Majorana seems largely a design of the physicist himself, and in the first section of the text he ties the content of the letters left behind to Majorana's broader philosophy. In reviewing the three letters, Agamben (2-5) describes how the first seems to indicate that Majorana is fleeing the country, the second suggests a forthcoming suicide, and the third states that Majorana is returning, but has finished lecturing. Insofar as he did not disappear directly after the first letter, die after the second, or reappear after the third, the only 'facts' available cannot possibly describe the reality of the situation; or, as Agamben concludes, 'the disappearance of Majorana is equally certain and improbable … it cannot be proved and ascertained at the level of facts' (6). The case of Majorana has attracted popular and official research in Italy, but still remains mysterious.

Agamben turns for insight to one of Majorana's posthumously published essays, entitled 'The Value of Statistical Laws in Physics and Social Sciences' (included as an appendix to the main text). In it, Majorana discusses the implications for the science and human existence of a quantum worldview based on probability rather than certainty. The essay explores in particular Heisenberg's then-recently-discovered uncertainty principle, which is generally taken as a statement about the limits of knowledge about a given physical entity in an experiment, but which Agamben argues permits 'the investigator to "command" or "determine" the state of the system to an unheard-of degree' (13). The implication for the social world, then, is that 'just as the probabilistic laws of quantum

mechanics aim not at knowing but at "commanding" the state of atomic systems, so the laws of social statistics do not aim at the knowledge of social phenomena but at their very "government"' (14). Agamben's hypothesis, then, is that Majorana's disappearance was a rejection of a science bent on governing the world.

It is at this point that Agamben turns to an essay on the new quantum physics written by Simone Weil, alongside other contributions by physicists of the time. While Agamben's own (unpublished) laurea dissertation was written on Weil's philosophy and many themes are common between his work and hers, direct mentions of her work have been sparing. While this middle third of *What is Real?* will no doubt be disappointing to those seeking insight into Agamben's reading of Weil, it is nevertheless erudite in the linking of Weil's reflection of the role of indeterminacy of quantum mechanics and the world with the experimental writings of Planck, Einstein, Schrodinger, and so on. Agamben here concludes that the central paradox of the quantum world is that it takes on an 'ontology of the probable' (28).

The final third of the text offers what we might call an archaeology of probability, as Agamben reviews the introduction of chance in discussions of dice games by Gerolamo Cardano in the late sixteenth century, followed by the work of seventeenth-century mathematicians up to the correspondence between Pascal and Fermat on *hasard*. Agamben argues that in games of chance and other situations involving a sort of risk calculation, we abide a probabilistic logic that is fundamentally distinct from reality as such—indeed, the unlikely event of a plane crash 'remains such even after the plane has actually crashed' (32). Probabilities are thus managed according to calculation (e.g., gain and loss), without any effect on determination or reality. Agamben argues that 'probability is never punctually realized as such' but 'allows us to intervene in reality … in order to govern it' (35). What matters is not the individual actual event, but the potential gain or loss of the probable states.

In the conclusion, Agamben returns to Aristotle's metaphysics of potentiality and act, arguing that quantum mechanics fundamentally flattens the hierarchy between the two. Indeed, for Agamben, 'what happened in modern statistics and quantum physics is that the writing tablet—pure possibility—replaced reality, and knowledge now knows only knowledge itself' (40). The disappearance of Majorana represents for Agamben the physicist's rejection of a world separated from reality, and the equally improbable possibilities he left behind symbolize the paucity of knowledge of knowledge alone.

What is Real? is an unexpected contribution from Agamben, but the ability to combine multiple complex themes into an engaging and insightful text demonstrates his insight as a philosopher. While his thesis about the disappearance of Majorana as a protest or at least as a concrete embodiment of uncertainty bears more poetic than historical merit, the broader discussion of the ontological stakes of quantum physics represents an important volume for the growing field of quantum social theory. The short volume also offers frequent readers of Agamben some small insight into his reading of Weil, though here too we are left reading between the lines of works like *Potentialities* in an effort to grasp the depths of the connection.

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