1163-01-158   **David E. Dunning*** (`david.dunning@maths.ox.ac.uk`). *"Essentially Physical": Deduction, Writing, and the Reflexive Turn in Modern Logic.*

Mathematical logic is a paragon of abstraction; and yet, reflecting in 1938 on his discipline's recent breakthroughs, American logician Emil L. Post insisted on its materiality. "Modes of symbolization and processes of deduction are themselves essentially physical," he wrote, "and hence subject to formulations in a physical science." In this talk I explore the physicality of deduction as experienced and exhibited in the classic reflexive arguments of 1930s mathematical logic. I focus especially on Alan Turing's famous 1937 paper that used the metaphor of a "universal machine" to argue for a negative answer to the decision problem for first-order logic. I cast a comparative eye toward the works of Gödel and Church, and put all these texts in dialogue with Post, their forerunner and also an insightful commentator upon them. In all these milestones of modern logic we find a productive tension between soaring heights of abstraction on one hand and, on the other, attention lavished on the mundane facts of the writing of mathematics. By foregrounding mathematical logicians' efforts to take physicality seriously, we can understand logic's transformation from a discipline that used symbolic systems to one that took such systems as its fundamental concern. (Received August 24, 2020)