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THIN- AND FULL-BLOODED PLATONISM

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General Setting

Mathematical theories seem to be objectively true in the sense that they are true independently of us and of our mathematical theorizing. Several features of mathematical and scientific practice support such a view. Mathematical practice treats its discourse objectively. Gödel's first incompleteness theorem seems to show the independence of the mathematical realm – some mathematical theories are true in some sense that goes beyond the theory's means of deciding their truth. Moreover, scientific practice also seems to presuppose mathematical objectivity. The apparent indispensability of mathematics to scientific theorizing led philosophers like Putnam ([31, 32]) and Quine ([34, 35]) to mathematical objectivity: if we believe what our theories say about forces and fundamental particles, we ought also to believe what they say about functions and numbers, given that our best scientific theories involve an unavoidable appeal to an inextricable combination of physical and mathematical entities. Traditional Platonism provides the most straightforward way of upholding mathematical objectivity. This is the view that mathematical objects are abstract objects that exist independently of us and of our theorizing, and that our mathematical theories are true (false) to the extent that they correctly (incorrectly) characterize those objects.

However, mathematical objects of the kind required by Platonism appear to differ from their everyday and scientific cousins in at least two important respects. They are abstract. And their very existence and identity are intimately connected with what we say, think, and theorize about them. In his [4] and [3] respectively, Paul Benacerraf showed how these two features of mathematical objects – their abstractness