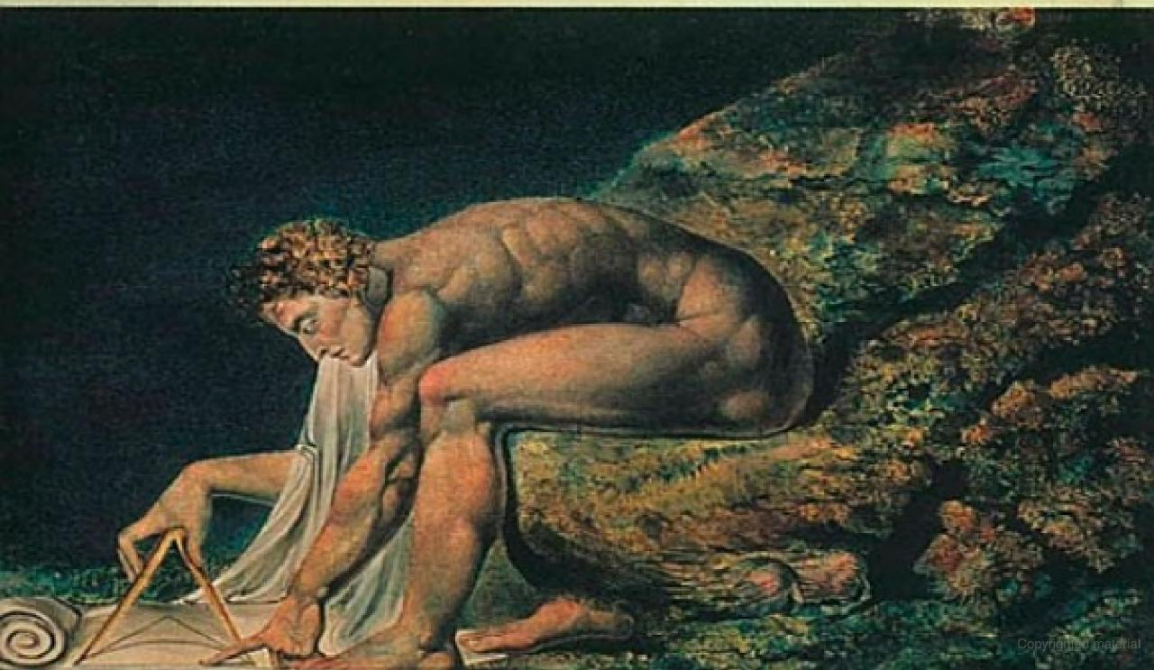
THE GREAT PHILOSOPHERS

RAY MONK

Bertrand Russell



Consulting Editors
Ray Monk and Frederic Raphael

RUSSELL

Mathematics: Dreams and Nightmares

Ray Monk

Contents

ABBREVIATIONS OF RUSSELL'S WORKS USED IN THE TEXT

Auto 1	*The Autobiography of Bertrand Russell 1872–1914*, London, Allen and Unwin, 1967
Auto 3	*The Autobiography of Bertrand Russell Volume III, 1914–1944*, London, Allen and Unwin, 1968
CPBR 2	*The Collected Papers of Bertrand Russell 2*, London, Unwin Hyman, 1990
EA	*Essays in Analysis*, London, Allen and Unwin, 1973
HWP	*History of Western Philosophy*, London, Routledge, 1991
LA	*The Philosophy of Logical Atomism*, La Salle, Illinois, Open Court, 1985
ML	*Mysticism and Logic*, London, Unwin Paperbacks, 1976
MPD	*My Philosophical Development*, New York, Simon and Schuster, 1959
NEP	*Nightmares of Eminent Persons*, Harmondsworth, Penguin, 1962
POM	*The Principles of Mathematics*, London, Allen and Unwin, 1985
PM	*Principia Mathematica to *56*, Cambridge University Press, 1962
PFM	*Portraits from Memory*, London, Allen and Unwin, 1956

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THE PYTHAGOREAN DREAM

'The first thing that led me to philosophy', Bertrand Russell wrote late in life, 'occurred at the age of eleven.' It was then that his older brother, Frank, taught him Euclid's system of geometry. As he describes it in his *Autobiography*

> This was one of the great events of my life, as dazzling as first love. I had not imagined that there was anything so delicious in the world. After I had learned the fifth proposition, my brother told me that it was generally considered difficult, but I had found no difficulty whatever. This was the first time it had dawned upon me that I might have some intelligence. From that moment until Whitehead and I finished *Principia Mathematica*, when I was thirty-eight, mathematics was my chief interest, and my chief source of happiness. Like all happiness, however, it was not unalloyed. I had been told that Euclid proved things, and was much disappointed that he started with axioms. At first I refused to accept them unless my brother could offer me some reason for doing so, but he said: 'If you don't accept them we cannot go on', and as I wished to go on, I reluctantly accepted them *pro tem*. The doubt as to the premises of mathematics which I felt at that moment remained with me, and determined the course of my subsequent work.
>
> (*Auto I, 36*)

'Dazzling' and 'delicious' are not words that one would normally associate with learning geometry, and yet Russell's rapturous reaction has an intriguing precedent. According to Aubrey's *Brief Lives*, when the seventeenth-century British philosopher Thomas Hobbes was forty years old, he happened to glance at a copy of Euclid's *Elements* that was lying open on a desk in a library he visited. It was open at the proof of the famous Pythagorean Theorem. 'By God, this is impossible!' Hobbes exclaimed:

> So he reads the Demonstration of it, which referred him back to such a Proposition; which proposition he read. That referred him back to another, which he also read. *Et sic deinceps* [and so on] that at last he was demonstratively convinced of that truth. This made him in love with Geometry.

For both Hobbes and Russell, the almost erotic delight they took in learning Euclid's geometry ('as dazzling as first love') was aroused by the feeling of finally coming to know something with complete certainty. The beauty of Euclid's system is that it is axiomatic. Everything that it teaches about circles, triangles, squares, etc. is not just stated but *proved*; complicated and surprising things about the relations between angles and lengths and so on are shown to be merely logical consequences of a few, simple axioms. It's as if a whole, vast body of knowledge has been spun out of virtually nothing, but, more than that, this body of knowledge is not tenative or provisional, it does not depend upon the contingencies of the world, but rather can be established once and for all. If one accepts the axioms, one *has* to accept the rest; no further doubt is possible. To someone who wishes, as Russell passionately wished, to find *reasons* for their beliefs, the exhilarating possibility this opens up is that some beliefs at least can be provided with absolutely cast-iron foundations.

Bertrand Russell had special reason to find the experience of certain knowledge intoxicating, for, up until his introduction to Euclidean geometry, his world had been

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