Exploring concepts

People who decry belief in God—or, indeed, knowledge of God—in the name of science ignore the nature of science. Quite apart from the reality that science is not a single area of study or uniform practice, but instead comprises a variety of disciplines, each with their own methods of research, there is the crucial point that science does not proceed by facts so much as by theories, which are discarded as soon as another theory becomes more compelling as an explanation. This is what the philosopher of science Thomas Kuhn described in 1962 as 'paradigm shift', whereby science does not evolve gradually towards 'truth' but moves from one set of concepts (a paradigm) to another once the initial one ceases to be relevant.

There have been many examples of this throughout history. At one time, for instance, the universe was thought to be eternal, whereas now it is believed to have had a beginning with the 'Big Bang'. Moreover, until Pythagoras in the sixth century BC, the earth was held to be flat, not spherical, and while this paradigm might not have been jettisoned for another three centuries, it was eventually replaced by the spherical, geocentric view of Aristotle around 330 BC, who provided supporting evidence based on observation. This method led to Aristotle producing a physical law describing the motion of heavenly bodies as perfect and circular and thereby devising a complex model of the universe based on a series of concentric crystalline spheres orbiting the earth. To account for variations observed in the system, the model was elaborated and fine-tuned still further by Ptolemy in the second-century AD, to be finally adopted as the orthodox view by the Catholic Church in the early Middle Ages. And while this model was subsequently challenged in the sixteenth century by astronomers and philosophers such as Nicolaus Copernicus, Johannes Kepler, Giadorno Bruno, and Galileo Galilei, who supported a heliocentric view of the universe, it was not until 1687 when Isaac Newton published his laws of motion that the Ptolemaic system was finally put to bed. These laws of Newton together with his law of gravity explained why Earth and the other planets could only move around the sun. And just as Aristotelianism gave way to the Newtonian system, which then became the new scientific orthodoxy, so then, in the early twentieth-century, were Newton's ideas overhauled by Albert Einstein's theory of General Relativity, which refined Newton's concept of gravity (as the curvature of space-

time) and explained the movement of Mercury, where Newton's system had been unable to. As things stand, despite Einstein being awarded the Nobel Prize in Physics for his work on quantum theory, he is now widely thought to have been mistaken in his negative attitude to quantum mechanics, while the work of physicists Niels Bohr, Max Planck, Erwin Schrödinger and Werner Heisenberg represents the dominant view.

Likewise, in relation to medicine, until the seventeenth century, when knowledge of chemistry improved, most doctors thought that the body was made up of various 'humours' (following Hippocrates: blood, phlegm, yellow bile and black bile), which led to treatments such as bloodletting and purges. Nowadays this would be regarded as mere 'pseudoscience'. And it was only in the nineteenth century that it was ultimately discarded with the advent of germ theory, the currently accepted theory for many diseases. Similarly, chemical substances have been postulated in the past which are discredited today. Two notable ones are phlogiston, which in the seventeenth century was thought to be a fire-like element released during combustion until it was replaced a century later by caloric theory, and caloric itself, a hypothetical elastic fluid assumed to comprise a weightless gas that embodied heat, now superseded by the theory of thermodynamics.

Thus we can see how scientific notions have invariably been subject to change as one theory gives way to the next. Science is not a fixed body of concepts. Uncertainty reigns. And no more so than with Heisenberg's Uncertainty Principle, which states that the position and speed of an object cannot both be measured exactly at the same time, In other words, you can either know how fast objects are travelling or where they are located, but not both; the very concepts taken together have no meaning in nature. While simultaneous measurement might work for everyday objects such as cars, at the smallest level of subatomic particles it proves impossible and the very act of measuring will make the particle's behaviour unpredictable. Heisenberg believed so strongly in the extent to which science proceeds largely by limited understanding that he is reputed to have said, 'Only a few know, how much one must know to know how little one knows.' In other words, absolute answers to questions are not the province of science. Science can tell us a lot about how the natural world works; it cannot tell us what it all means.

The bottom line is that those who claim that there is no God because science proves as much are just as much guided by personal belief as those who believe that God is a real presence in their lives in the world—because neither belief can be disproved or 'falsified' but must remain a question of faith. And it is sheer blind faith to believe otherwise.

Glossary

Combustion	The act of burning.
Geocentric	Earth centred.
Heliocentric	Sun-centred.
Pseudoscience	A way of explaining things that claims to be scientific and factual but instead lacks the thoroughness of a genuine scientific approach.
Quantum theory	A fundamental theory of modern physics that seeks to explain the behaviour of energy and matter at very small scales and the mechanics involved in this. Its applications include computer chips, lasers, and the light-emitting diodes (LEDs) employed in lights.
Space-time	The three dimensions of space interwoven with the one dimension of time to form a four-dimensional structure that is thought to be curved under certain circumstances.