

The inconvenient relation between science and religion

The prevalence of the heliocentric theory



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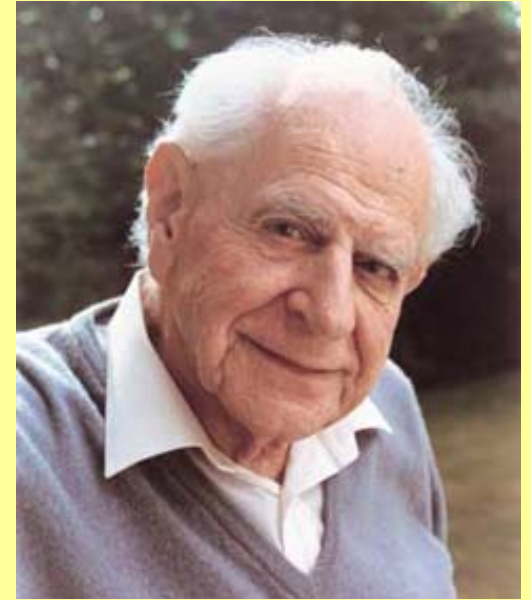
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Which is the relation between **religion** and **science**? Or rather between religious dogma and science? Convergence or opposition? Is this relation truly inconvenient? In order to answer these questions thoughtfully, we must first juxtapose these two primal notions.

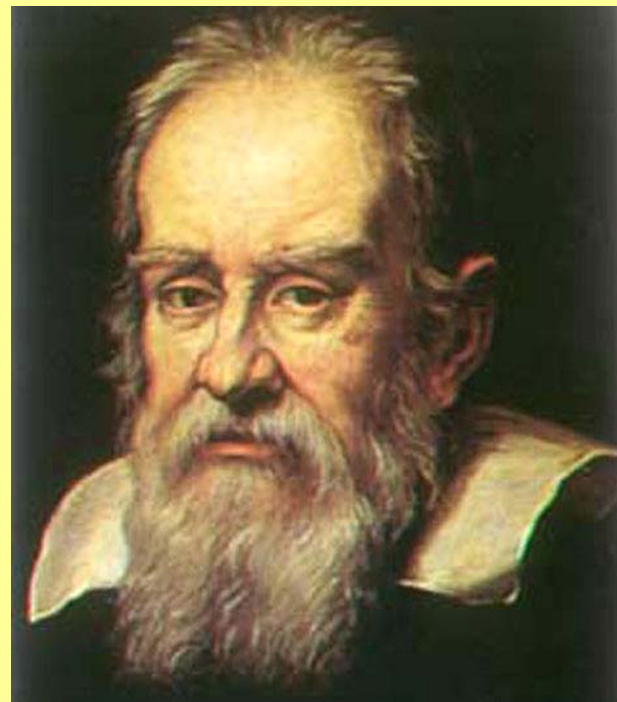
- In the case of a religious dogma, faith must be absolute. *Dogma* as a theory can be proved only through itself and its power is the absence of doubt.
- On the contrary, in the case of science, according to the philosophical view of Descartes, *doubt* should be present in any problem arising in order to avoid possible errors and prejudices; through doubt we can be led to the discovery of an indisputable truth. So the Cartesian doubt in the area of science is the main methodological starting point.

Religion is faith and absolute truth, while science is doubt and **falsifiability** (or refutability). Karl R. Popper, for example, was critical against the inductive methods in science. All inductive proofs are limited, he said: falsifiability should replace the ability for verification as a criterion of the difference between the scientific and the non-scientific. Science is seen more in the frame of an unending search for objective knowledge, rather than in the frame of a knowledge system.



Science is seen more in the frame of an unending search for objective knowledge, rather than in the frame of a knowledge system. The principle of falsifiability is for Popper the criterion for the scientific or non-scientific character of a given theory. Thus, astrology, metaphysics and the Marxist theory are classified as *pseudosciences* because of their incapability to be subjected to the application of the falsifiability principle. Within a religious structure there is no phenomenon that can refute the theory. In science, when something new is discovered, anything that contradicts, even partially, to the prevailing theory, then, sooner or later, the theory is replaced by a new theory. According to Popper scientists should rather try to disprove their theories than to verify them time and again.

But let us consider our main topic, namely the prevalence of the heliocentric system and the controversy it created between science and the Christian Church. When Galileo observed with his telescope in 1609-1610, the geocentric theory suffered a blow, in spite of the reactions that followed by various scholars and the Roman Catholic Church, which had incorporated geocentric system as its favored one.



The fundamental difference between science and religion mentioned was always rendering their relations inconvenient, especially in the West. For a certain period these relations were so tense that blood was shed in their sake; but it was rather the relation between the prevailing dogma and Reformation or the coming change that made that happen, and not the relation between religion and science.

It is an indisputable fact that the military and political power of the Holy See hindered for a long time the development of knowledge and hence science. Galileo stood trial on suspicion of heresy and he was condemned into house arrest because the heliocentric system he was supporting was at odds with the Old Testament.

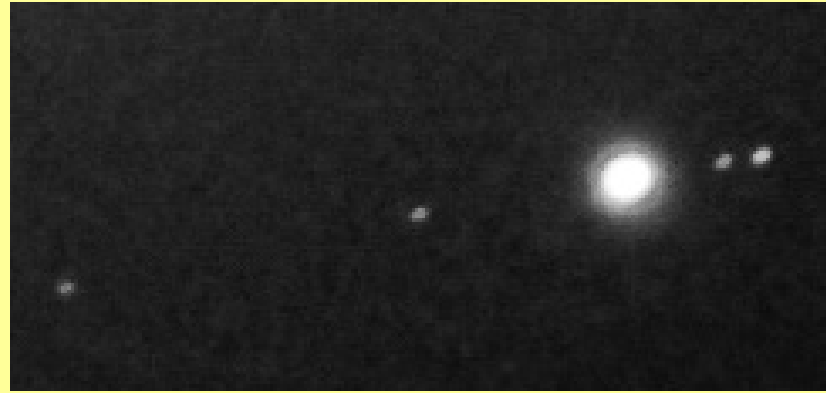
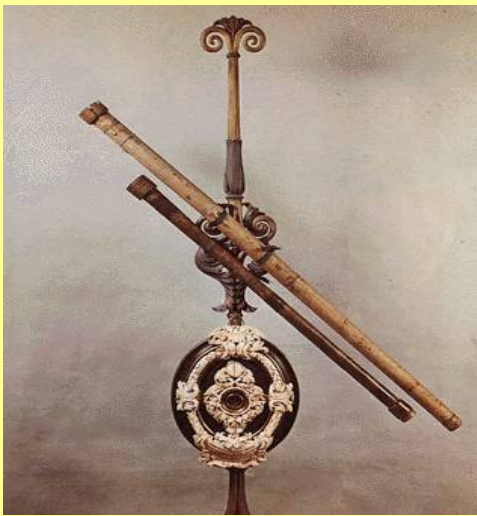


- **The Gibeon Battle and other Scripture references**

The ancient city Gibeon was to the northwest of Bethlehem; during the battle conducted there by Joshua against the Canaanites, Joshua asked God to cause the Sun and Moon to stand still, so that he could finish the battle in daylight and win it: *“and he said in the sight of Israel, Sun, stand thou still upon Gibeon; and thou, Moon, in the valley of Ajalon. And the sun stood still, and the moon stayed, until the people had avenged themselves upon their enemies... ..So the sun stood still in the midst of heaven, and hasted not to go down about a whole day.”* (Joshua 10:12-13, KJV)



The stillness of the Earth and the respective motion of the Sun is apparent also in other parts of the Old Testament, as in the *Psalms* and the *Ecclesiastes*: “*the world also is established, that it cannot be moved*” (*Psalms* 93:1, KJV), “*He appointed the moon for seasons: the sun knoweth his going down*” (*Psalms* 104:19), “*The sun also ariseth, and the sun goeth down, and hasteth to his place where he arose*” (*Ecclesiastes*, 1:5).



The revolution for the observation of the heavens came from Galileo in 1609, when for the first time in the history of astronomy he used a pioneering for the times instrument, the telescope, which gave him the ability to discover wonderful things in the firmament: from the phases of Venus to the four large satellites of Jupiter, a miniature planetary system.

That year belonged to the first decade of the 17th Century; a century that marked a period of multiple crisis. Philosophy, religion and science itself found themselves into a maelstrom that shook the foundations of Western society. That maelstrom engulfed in its whirl the foundations of astronomy. The “peaceful” geocentric / *ego*-centric system that was prevailing for many centuries gave its place to the correct heliocentric one.

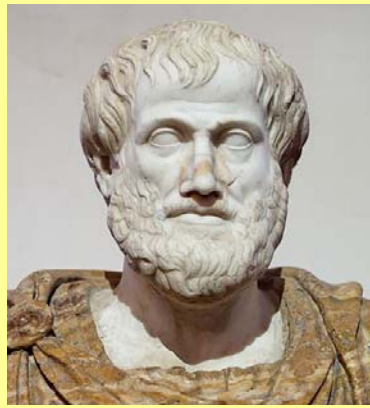


At least two to three centuries before 1609, the West was a boiling pot. Great scholars, such as Jean Buridan (Johannes Buridanus, ca. 1295-1358), Nicolas d' Oresme (1323-1382), Nicolaus Cusanus (von Kues, 1401-1464), Copernicus (1473-1543) and many others in the natural sciences, centuries before Galileo and Kepler, based on the Pythagorean and pre-Socratic Greek natural philosophers, had added to the building of the new physics; at the same time, they had ignited the great change in science and in the way to understand natural phenomena. A change that, stemming from the mentality shift in astronomy, was now focusing attention to switching the European scientific thought from theory to practice, through experiment, observation and the use of mathematics and their methods.



Jan Matejko
(1838-1893):
*"Astronomer
Copernicus:
Conversation
with God"*
(1872)

Nicolaus Copernicus hid his fundamental work *De revolutionibus orbium coelestium* for years, exactly because he did not dare and want (as a priest himself) to clash with the Roman Catholic Church, to which he always belonged. His research was in support of the heliocentric system. Copernicus was according to Martin Luther "*the fool who wanted to overturn the science of astronomy*".

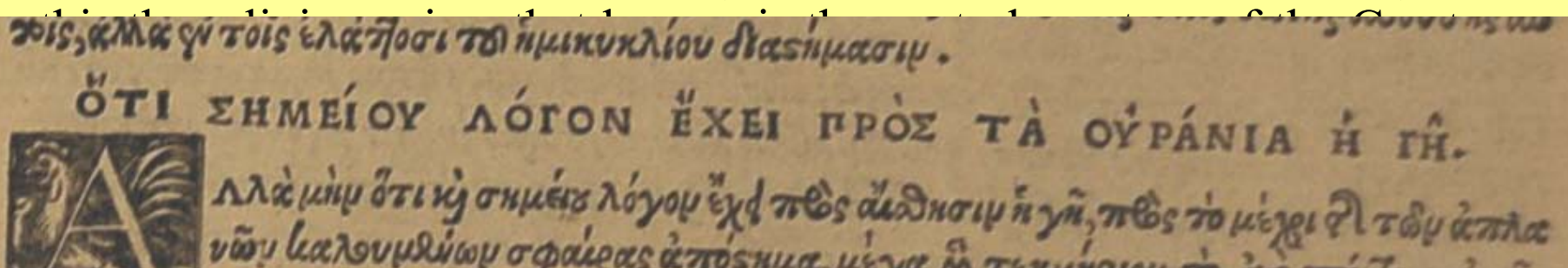


Galileo (1564-1642), the first physicist with the modern meaning of the term, rejected through his experiments the common perception for motion, setting the base for the modern mechanics, while Descartes (1596-1650) generalized the re-explaining of everyday experience and proposed a new image of reality beyond experience. Descartes tried to show through his philosophy that nature's reality is not similar to what our senses present to us. Our world is not a finite wholeness with an impeccable internal structure, as it was presented in Aristotle's view of Cosmos.





These scientists, by indicating the weakness of the geocentric theory were undermining in an essential way the egocentrism or the man-centered Universe, in other words a basic aspect of the Christian worldview, for which human is the center and the reason for all Creation. Indeed, the German Neo-Kantianist philosopher and historian of philosophy Wilhelm Windelband (1848-1915) assigned to the Christian worldview a “human-centered character”, because according to it (in contrast to the ancient Greek thought) human and human history become the reason for the Universe. Yet, the human-centered view was inherent in all ancient astronomy, capitalized with the Ptolemaic view for the Cosmos (with the Earth at the center of it). To



Kepler, a mystic and religious person, believed that the Universe was full of secret and transcendental forces. He was convinced that if he plugged the mystic mathematical harmonies into the study of the celestial sphere he could connect the planetary orbits with perfect geometrical solids. According to the German astronomer only the motions of the celestial bodies, eternal and perfect as they were, could be analyzed geometrically, since for him astronomy should be based on principles of geometrical simplicity.

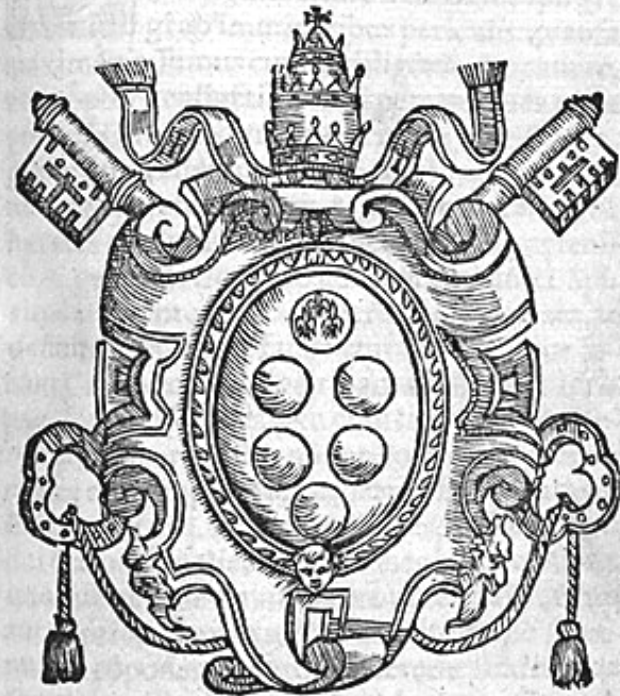


However, Kepler was a Protestant and as such he never felt the pressure of Catholicism and the Inquisition. With his book *Astronomia nova* (1609), came into conflict with the then prevailing ideas. The adoption of the material moving force he proposed was a blow against the divinely created cosmic order, imposed by the Aristotelian physics. It can be said that the observational justification of the heliocentric theory began with Galileo and its mathematical foundations were laid exclusively by Johannes Kepler.

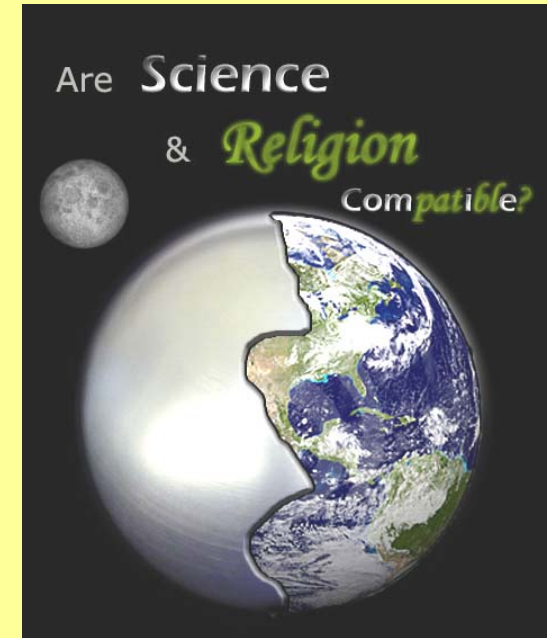
The heliocentric theory of Aristarchus and Copernicus was a blasphemy according to the Church, because it sowed the ideas for a science uncontrolled by Catholicism and the Inquisition. For this reason, in 1616 this theory was condemned by the Roman Catholic Church as irrational, impious and “pseudo-scientific”. This condemnation lasted until 1820, when the heliocentric theory was regarded by the Church as rather “proved” and “scientific”; after that, the persecution against its supporters stopped.

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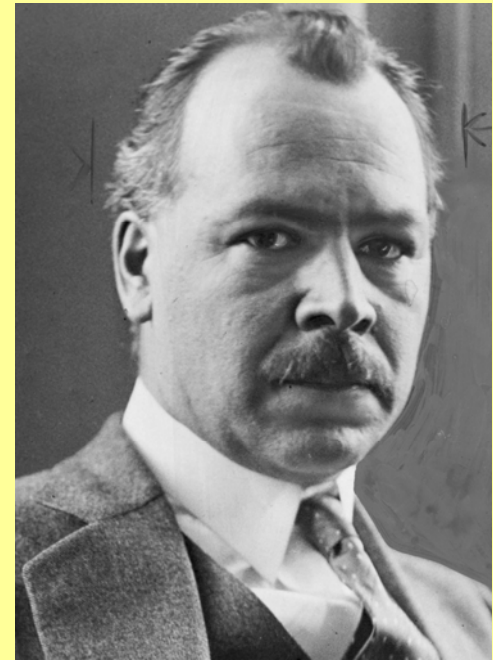


VENETIIS, M. D. LXIII.



Was there a solution? Of course! The true solution to the problem of relations between science and religion was and still is the separation of their roles. In any case, God is beyond the limits of science; he reveals himself, he can't be calculated with equations or through theories; therefore, the *scientific* occupation of scientists with the divine is both dangerous and vain.

It must be noted that these questions are important not only because the terms “science” and “scientific” are present everywhere. The problem of the boundaries of science is also of great social and political importance. We should not forget that in the late Soviet Union the communist party had the right to decide what was correct science and what was not, at any given case. Besides, the understanding of what is or is not science influences more or less the scientific policy of the State, and this has consequences for the advancement or the stagnation of the scientific or the corresponding technological research.



Nikolai Vavilov

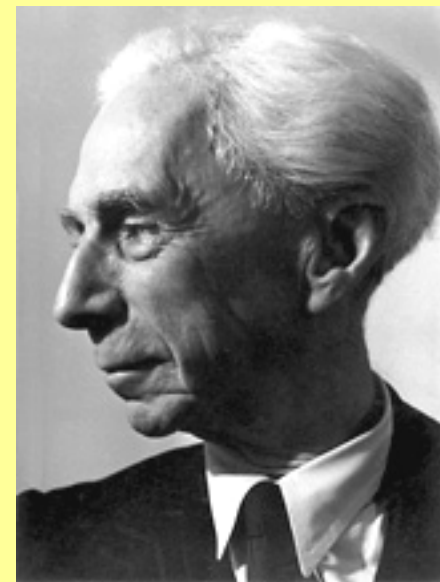
For example, an empiricist’s view on what is science favors the blind empirical research without interest for its theoretical foundations: The United States Air Force keeps an office responsible for the collection and analysis of information concerning the Unidentified Flying Objects (UFOs), which are normally reported to ignore the known laws of physics! Also, several universities keep laboratories dedicated to “paranormal research”, which is at odds with the “official” natural science and has up to now failed to give a single natural law.

According to Alexandre Koyré, the scientific revolution of the 17th Century smashed the ancient Greek notion of Cosmos, of the Aristotelian vision, a world of first impressions, and replaced it with an Archimedean Universe of precision, of the “geometrization” of space and of measure. The real world is not considered anymore a closed, finite and hierarchically structured wholeness, as limited by the mediaeval approach, which explained the world based on the Bible in accordance with the ancient Greek geocentric view; instead, it is an open, infinite and vague Universe, defined by the natural laws and by its fundamental components.

The clash in the crucial field of cosmology and the different way to approach and study nature was the point of transit to the final theory of the Universe without an “edge”. This clash was provoked by the works of great scientists and philosophers of the 16th and 17th Centuries, including Copernicus, Tycho Brahe, Kepler, Galileo, Descartes and Newton.



As Bertrand Russell writes: *“Kepler and Galileo proceeded from the observation of separate events to the formulation of accurate quantitative laws; with their aid future events could be predicted in detail. They annoyed a lot their contemporaries, because not only their conclusions were in stark contrast to the beliefs of that period, but also the blind faith to an authority allowed the savants to limit their researches in the libraries and the professors were utterly upset by the idea that they would have to observe the world in order to learn exactly how it is.”*



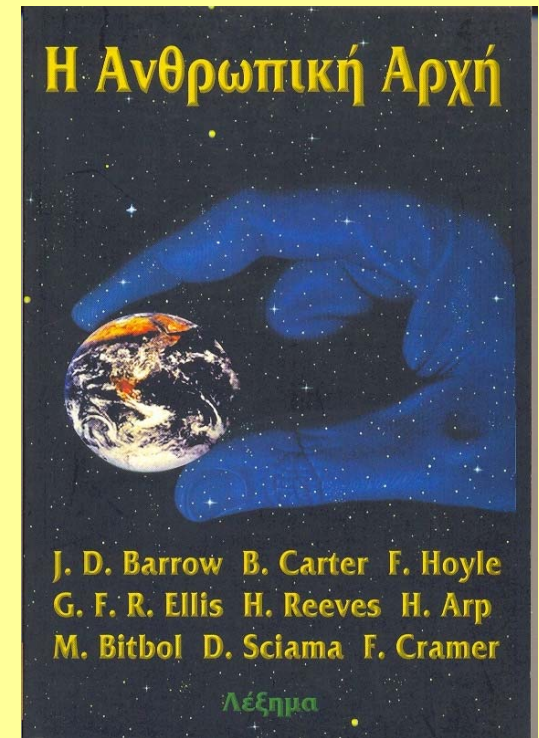
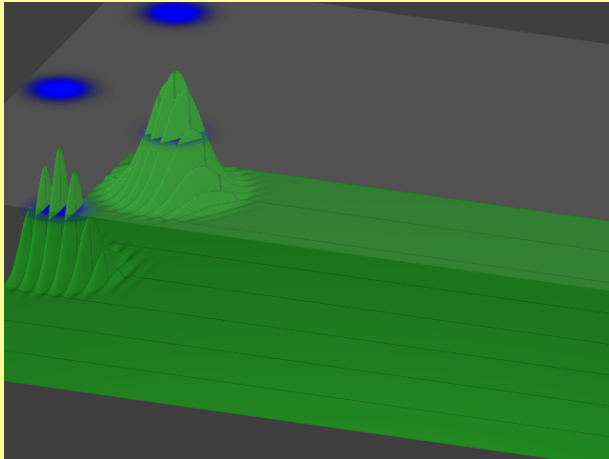
In this passage Russell gives us the main characteristics attributed to science by the so-called **positivist** philosophers, such as John Stuart Mill, Herbert Spencer, or the more recent ones Moritz Schlick, Otto Neurath, Kurt Gödel, Rudolf Carnap and others.

In very broad lines, for **positivism** science means sure and proved knowledge. Science provides the only method to reach absolute certainty. The scientific theories are built based on general and personal prepositions. According to positivism, we start from the partial, i.e. the personal propositions that describe observations, and we end up with the general, that is the universal propositions, which are the laws of science.

The two basic principles of the original positivism are:

- 1) Every piece of knowledge that pertains to events-phenomena is based on the “positive” elements of experience
- 2) Beyond the world of natural phenomena there is the world of pure Logic and pure Mathematics.

Positivism, as a main component of the physics mentality, is secular and against metaphysics; it sticks to the testimony of observation and experience – positive knowledge and experiment. Positivism, by rejecting metaphysics, helped to supersede preoccupations of the past and forwarded the development of the logical physical thought. In a positivistic world view, science is considered the way we can discover the truth and understand the world as good as possible, so that we will be able to predict it or change it.



Positivism, however, met some serious problems in the natural sciences from the advancement of physics and cosmology in the 20th Century. The most serious challenge to it is presented by **quantum mechanics** and its inherent insurmountable obstacles against achieving “absolute certainty” with science.

In 1990s people even started talking about the so-called “**anthropic principle**”, an attempt to put back humanity from utter insignificance to significance in the Universe, in harmony with Christianity’s position.

WHY
THE SCIENCE
and RELIGION
DIALOGUE
MATTERS



VOICES *from the*
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Edited by Fraser Watts & Kevin Dutton