Science and religion: an alternative approach

Abstract

The possible influence of religious beliefs on science has attracted the interest of historians of science, theologians, scientists and philosophers. Yet in my opinion, the approaches traditionally used to connect religion and science, remain un-satisfactory. The main problem is that religious influence is most of the times depicted as optional, occasional and not really significant. In this article an alternative approach is proposed, that would make this field of research much more "mandatory" for all scholars interested in science. This approach is based on a certain understanding of religion and of its un-avoidable repercussions on theory-formation. A few examples of religious influences on several scientific disciplines are sketched.

Key-words: The influence of religion in science; philosophy of science; the nature of religion; religious beliefs; religion and mathematics; religion and physics; religion and psychology; religion and philosophy of science.

Mr Vice Rector (Prof. Fika Van Rensburg), Mr Acting Dean (Prof. De la Rey Van Der Waldt), colleagues, students and friends, thank you for being here. It is for me a privilege to share with you a few thoughts on the topic of religion and science. During the last *Stoker Lectures*, Prof. Pieter Duvenage said that since the 1850s this subject has been in the agenda of Afrikaans-speaking intellectual circles in South Africa. Twenty years ago I came to Potchefstroom from Italy to learn from you how religion and science should be related. It is a small part of a broader issue: how should we connect Christianity and politics, religion and art, faith and everyday life.

Some of the Professors who taught me about these issues are here tonight. This is for me a motive of delight. I cannot avoid remembering the promoter of My PhD thesis, Professor Elaine Botha, who identified several "turns" in philosophy of science (1994). For example, a logical turn emerged around the 1940's, when logic was regarded by many as the fundamental factor in science. Quite soon, however, a historical turn took place, followed by a linguistic turn, a social turn a cognitive turn

and so forth. Prof Elaine noticed that, notwithstanding the multiplication of the turns, religious belief is often still neglected by philosophers of science as a possible key to understanding scientific theorizing better. She was certainly aware that many efforts were made and different strategies were used by Christian authors in various disciplinary fields. Yet she was not convinced that religious factors were given their due.

Surely the science-and-religion topic has always attracted large academic interest. Among the "top" philosophers of science one can mention the contributions of Polanyi and[1] other Roman Catholic philosophers like Stanley Jaki, Ernan McMullin, Frederick Suppe and so forth. In the Netherlands, Herman Dooyeweerd[2] developed a neo-Calvinist perspective on the topic. Beyond Christian circles, one could mention the work of Fritjof Capra (1975), pointing out the parallels between modern physics and Eastern mysticism.[3] In addition to the philosophers, one could also mention Christian theologians, historians of science and scientists from different epochs and confessional traditions. Brooke (1996: 3-16) distinguishes several ways in which the Christian faith (religion or theology) has been "utilized" by some scientists and scholars and regarded as an important factor for scientific theorizing.

Yet the main problem with most of these Christian approaches is that they portray the influence of religion on science as rather optional and occasional. In other words, religious influence is not deemed to be always present, but rather to depend on the personal attitude of the scientists and perhaps on the field of research. By contrast, social or psychological factors, for example, normally and constantly accompany

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[1] Concerning Polanyi, I have in mind especially his *Science, Faith and Society* (1946). One could even say that "commitment" is the key-factor in his understanding of science. Occasionally, Christian terms and metaphors were appropriated, for example by Kuhn who described paradigm-adoptions or paradigm-shifts in terms of "conversion" and "faith" (cf. Kuhn, 1996: 144, 150, 152, 158, 159).

[2] Herman Dooyeweerd (1894-1977) is a Dutch neo-Calvinist philosopher who initiated, with D. H. Th. Vollenhoven, the school of "reformational philosophy". This movement is linked to the work of the Dutch statesman and theologian Abraham Kuyper (1837-1920). Among the authors mentioned in this text, Botha, Clouser, Strauss (Wolterstorff to an extent) and the present writer can be associated with this philosophical school.

[3] Of course the relationship between religion and science is discussed far beyond Christian circles, in Islam, Buddhism and so forth, but my present exploration is limited to the Christian approaches.

scientific research. Another problem is that religious influence does not seem to be particularly important or to make a relevant difference in theorising. Finally, some of these Christian approaches focus especially on the past or seem to interest especially "religious" circles, for apologetic or dogmatic purposes.

In this article I would like to propose an alternative approach to this field of study, from a Christian point of view, concerning especially the influence of religious beliefs on scholarly theorizing.[4] The topic religion-and-science could enjoy wider attention, also in "secular" circles, if it could be argued that ultimate commitments of a religious nature exert a constant influence on scholarly theorising and make a difference. This argumentation will be developed in the following pages.

In order to show that science and scholarship[5] are influenced by religious orientations, it will be necessary to clarify the nature of religious beliefs. The latter, Clouser (2005: 23) argues, are beliefs about something/one that is regarded as independent from the rest of reality and on which the rest of reality depends. When acknowledged in this sense, religion is a universal phenomenon, not restricted to certain circles or persons; and it can be expected to affect all cultural activities. From this vantage point the claim emerges that philosophers and other scholars interested in science, need to pay more attention to the religious factors influencing scientific and scholarly theorising.

Factors and perspectives in science

Philosophers of science aim, among other tasks, at identifying the factors that play a relevant role in science and the perspectives that help understanding science and scholarship (Loubser, 2013). They also aim at determining which factors exert a legitimate influence on science and which other factors, on the contrary, should even be prevented from playing a role. For example Popper was convinced that although

[4] I will therefore leave a bit aside the impact of scientific theories on religious commitments and beliefs. The latter is a topic that surely deserves more attention than what it receives at present (cf. Wolterstorff, 2004: 80-85), but I will have to leave it for another occasion.

[5] The discourse of this article is especially related to the natural sciences. However, for reasons that will become clearer later (see Figure 1), I regard as sciences also mathematics, the humanities, the social sciences, philosophy and so forth. What I will argue about the natural sciences will often be applicable to the other sciences as well. For this reason I will often use phrases like "science and scholarship", or "scientific theories" or "(scientific) theorizing" as referring to all sciences.

psychological factors do occasionally infiltrate scientific processes, they should be kept in check. Logical factors, on the contrary, should in his opinion always play the role of the main character. According to Kuhn, by contrast, logical factors are not always decisive but exploring for example the "psychology of research" (Kuhn, 1970) would open new and crucially important avenues to understand the concrete functioning of a scientific community.

A similar debate concerns, of course, the disciplinary *perspectives* that we adopt to understand science. Coming back to Popper's (1970: 57-58) point of view, resorting to the help of sociology, psychology or theology would mean adopting a delusional strategy. These disciplines constitute a sort of "lunatic fringe" (Popper, 1970: 58). For Kuhn and others, however, one cannot understand science properly without making room at least for the historical perspective (Kuhn 1977; Peirce Williams, 1970). And does not Popper himself, asks Kuhn (1970: 22), utilize ethical arguments when he tells us what science *should* be? What about the social mechanisms that Kuhn showed to be operative in the scientific community? What about the communal acceptance of a new paradigm? Is it not often encouraged, from a psychological point of view, by propaganda and persuasion, or by the role played by "reputation" (Kuhn, 1996: 153, fn. 10)? In the long run, there was a multiplication of the factors and perspectives to be taken into account. There was, to use Botha's metaphor, a multiplication of the turns.

Was she hoping that a "religious turn" would emerge as well? I don't think so, as she regarded most of these turns as unbalanced and unjustified emphases on the role of a certain factor or perspective. She was rather hoping for "a more holistic theory", in which the different factors, including religious factors, could be given their rightful place (Botha, 1994: 27). Did she not realize then, that many, not only philosophers, were already busy exploring precisely the role of "faith" in scientific theorising? She was certainly aware of this, but she thought that their strategies were not satisfactory. In the following section we will therefore look at the most common strategies that have been used, in Christian circles, to show the relevance of religious commitments in science.

Mapping the historical landscape

In a concise but very insightful document, Brooke (1996: 3-16) presents the most common ways in which religion (faith, or theology) [6] played a role in science during the last few centuries. His "map" takes into account not only philosophers but also the work of historians of science, theologians and scientists. In this section I will follow his classification; I will only clarify it here and there when I find it potentially confusing and I will add a few examples that might help grasping Brooke's explanations better. My aim, however, will also be to argue that in most of the approaches listed by Brooke the influence of religion on science is pre-supposed as optional, occasional and not really significant.

Firstly, Christian belief has been regarded as a *presupposition* for science. Modern science needs presuppositions like, for example, the continuity, unity and uniformity of nature. These "metaphysical concepts" are regarded by some as direct products of the Christian belief in creation. According to Brooke (1996: 4) there is a "strong sense" or version of this idea: "without a Christian doctrine of creation there would have been no modern science". Among the supporters of this approach one finds authors like Thomas Torrance (e.g. 2001) and Stanley Jaki (1978). Hooykaas (1963, 1972) argued that modern science was made possible especially by the Reformation. More recently, Harrison (2007) avers that modern science is indebted especially to the Christian doctrine of the fall into sin and its noetic consequences.

It should be noticed, however, that even if it could be proven that Christianity gave birth to modern science, in most cases the latter is supposed to march on its own legs, once it comes of age. Religious influence is therefore conceived as limited to the initial stages of science and is not necessarily supposed to play a role in the daily choices of scientists. It stands "before", not "within" science.

Secondly, says Brooke (1996: 6-8), faith has often worked as a *sanction* for scientific research. I think Brooke has in mind here especially the maintenance of a broad scope for scientific inquiry. Belief sanctioned certain forms of scientific enquiry that could have been otherwise suppressed or neglected. We can think for example of the "two books" analogy promoted by Francis Bacon. As it was imperative to consult the book of God's *words* in all its details, it became also imperative to consult

[6] In the previous pages I had to adapt to this situation and to use "faith", "religion" or "theology" as synonyms. I found it virtually impossible to do otherwise, for example when I had to discuss my views in relation to those of authors who do not distinguish these terms clearly.

the book of God's *works* in all its corners. But nothing of course, it should be admitted, excludes that secular scientists could have been interested in the same research "corners" for purposes of their own. In addition, the reasons why specific interests were "sanctioned" are often puzzling. For example, "Luther liked alchemy because of its allegorical meanings: images of purification by fire brought the Day of Judgement to mind" (Brooke, 1996: 7).

Thirdly, faith-belief did function as a *motive* for following a certain direction or "paradigm" in science. The aim to glorify God could be met by pursuing a certain result that was supposed to celebrate God's handiwork in a clearer way. This is the case, for example, with Joseph Priestley who, as a dissenter, tried to show the consonance between science and Unitarianism. A chemistry purified of the presence of "spirits" could help overcoming the matter/ spirit dualism and re-establishing a sense of "unity". In his case, science was also supposed to help establishing, in the long run, a form of Christianity that could stand rational criticism and abandon "superstition". In some cases, therefore, supporting a certain type of "paradigm" instead of another was motivated by adopting a certain type of theology instead of another.

But again, it could be argued that the same paradigms could have been adopted for different (e.g. secular) reasons. Actually, these paradigms were not the result of religious influence. Like many philosophical trends, they were forged on secular premises and later adopted by Christians because they seemed to underpin a certain theology or scientific program better. One might even wonder, in this case, whether we are not dealing with the influence of science on religion.

Fourthly, one should consider the role of the *aesthetic dimension* in science. It is well-known that in selecting between rival theories, the criterion of simplicity may play a strategic role. Simplicity is often associated with symmetry, elegance, harmony and beauty. Of course these considerations do not automatically carry theological meanings. "In the past, however", says Brooke (1996: 10), "aesthetic considerations" have been "a bridge from theology to science and vice versa". A classic example is Copernican theory: the alignment of the earth with other planets showed symmetry. The correlation of planetary periods with their distance from the sun showed harmony. Even in this case, however, I suppose that simplicity, beauty or elegance could have appealed even to someone who was not interested in the bridge between science and theology.

Fifthly, beliefs have sometimes played the role of *regulative principles*. For Newton, space was homogeneous because it was constituted by the one and only God. Faraday derived his view of the correlation and ultimate unity of all physical forces from his faith-understanding of God's "power" (Rom. 1: 21; cf. Botha, 2007: 184-207). This belief guided his experimental work, notwithstanding his failure to demonstrate the connection between electrical effects and gravitational forces. James Clerk Maxwell seems to have derived some of his hypotheses from the doctrine of the Trinity. This category seems to link to the third one above, in the sense that here religion becomes internally operative for science and leads to the formation of hypotheses. The question remains, of course, to know whether it is legitimate, or even plausible, to understand God's "power" (in Romans 1), in a conceptual-physical sense, or whether the nature of space should be deduced from the nature of God. Here we face problems concerning the legitimate use of the Bible, problems that re-present themselves in the last (sixth) category.

Finally, according to Brooke (1996: 14 ff.), in some cases faith has "constituted science" (I would prefer to say that faith has "substituted science"). For an example, one can think here of "creationist" theories. Doctrines derived directly from Scripture have sometimes fulfilled an explanatory and scientific role. Brooke recognizes that this model is often linked to an "oppositional stance" (the old Anabaptist model and its modern versions), yet he (1996: 14) also argues that this need not always be the case. After all, Galileo was opposed by Roman Catholics, not by Mennonites. Was literalism the main culprit? According to Clouser (2005: 111 ff.) the idea that Scripture contains (at least some) scientific theories constitutes the distinctive hallmark of this trend, more than the literalist interpretation of Scripture. In any case, most Christians reject both the literalist reading of the Bible and the idea that the latter contains or reveals scientific theories.

I trust this brief historical survey confirms my initial hypotheses (and legitimizes Botha's dissatisfaction). Most of the times, Christian scholars have portrayed religion as an optional: some may appeal to their faith whilst others may proceed in a "neutral" manner. The influence of religious commitment has been also portrayed as rather occasional and not pervasive. In the above examples it concerned e.g. the "birth" of science, or the preservation of a few research topics. Probably, these goals could have been reached even without religious motivations. In some cases biblical doctrines were taken to be substitutes for scientific theories, which damaged both

faith and science. In this case one could note that, as biblical verses are applicable only to some theories, religious belief is implicitly regarded as irrelevant in all the other theories. Only in two cases (the third and fifth in Brooke's list), religious beliefs were used to choose a certain "paradigm" or as "regulative principles" for science. This means that in these cases they finally functioned *internally* to science. Yet the misuse of biblical texts rings a warning bell against these procedures.

Is there any hope left for considering religious belief as relevant for science? In the next section I would like to show that a re-structuring of the discussion is possible.

A new understanding of religion

Unfortunately there is no real consensus on the definition of religion. Some common ground, though, might be found in the agreement that a good definition should identify the characteristics that all religions have in common.[7]

At a popular level, and intuitively, we are inclined to associate religion with its "classical" expressions: Christianity, Islam, Hinduism and so forth. Religion is therefore associated with worship of a Supreme Being/s, certain rituals, sacred books, temples, leaders, priests and perhaps ethical prescriptions. Clouser's (2005: 11-17) analysis, however, reveals that none of these characteristics is shared by all religions. For example, not all the communities that are usually regarded as religious believe in a Supreme Being. Theravada Buddhism is perhaps the main example of a "religion without god", but in all Buddhist traditions the divine is traditionally associated with a "Void", with "non-being" or "nothingness". In Hinduism, Brahman-Atman is not considered a being, but rather "being-ness" or "being in itself" (Clouser, 2005: 12).

Characterizing religion by relating it to specific actions, rituals or practices is also quite problematic. For example not all religions include prayers or even worship among their practices. It could be suggested that we have religion whenever we have "rituals". Yet in many cases, the same rituals can be regarded as "religious" in a

[7] For the following section I am indebted to Clouser's (2005: 9-41) analysis of the nature and role of religion.

certain context and as non-religious (or even as crimes) in others.[8] Besides, are "rituals" also not present in courts, academies, parliaments and so forth?

Furthermore, not all religions adopt sacred books, or acknowledge sacred places or gather in temples. As far as ethical codes are concerned, we meet the strange situation that while membership of certain clubs does require ethical standards, not all religions prescribe such codes.

In other words, none of the characteristics mentioned above (others are examined by Clouser, 2005: 12ff.) seem to constitute the common ground that we are looking for, with the result that attempts at defining "religion" are nowadays usually given up. Yet according to Clouser it is possible to identify a common denominator of all religious beliefs, one that is present in all religious traditions without exception. He proposes the following definition.

> "A religious belief is a belief in something as divine per se, no matter how that is further described, where 'divine per se' means having unconditionally non-dependent reality" (Clouser, 2005: 23). [9]

The common denominator of all religions lies in the identification of someone or something that is *independent* from anything else and on whom/which everything else depends. To the extent that this definition is correct, it implies that religious belief or commitment is not an option that some people take whilst others leave. From this point of view religion is a universal human condition. Humankind is not divided in the two groups of believers and un-believers: all people breath, speak, socialize, care and are religious. It might be objected that this definition seems to ignore that there are atheists among us. Yet knowing what one *does not* believe does not exclude religious belief, just as knowing what a vegetarian does not eat

[8] In Clouser's (2005: 11) list, examples of actions that can be religious or non-religious depending on the context include: "burning a house, setting off fireworks, fasting, feasting, having sexual intercourse, singing, chanting, cutting oneself, circumcising, covering oneself in manure, washing, killing an animal, killing a human, eating bread and wine, shaving one's head" and so forth.

[9] According to Clouser there is also a secondary sense in which a belief is religious, namely when "it is about how the non-divine depends upon the divine per se" or if it is a belief "about how humans come to stand in proper relation to the divine per se" (2005: 24). This second sense of the definition, however, does not concern our discussion about science.

does not exclude that s/he may eat something else. Religion is about identifying the ultimate "bedrock" of reality and this is something that, consciously or less consciously, we all do.

We all do this because we cannot escape forming a view of reality, in which the different laws and properties are arranged in a certain way, given priority, overlooked and so forth. This is a way in which religion penetrates into theories. The biblical view of reality leads to a specific way of theorising in which it is not necessary to *reduce* the richness and variety of reality to Reason, Matter or Sensations. Different religious positions lead to different views of reality, and these lead to different theories or different ways of interpreting facts and states of affairs.

An example might help clarifying Clouser's argument: let us consider Marxism, a movement that often professed to oppose all religions. According to Marx's views, matter/energy is the basic reality. Within matter we have a law which causes things to change according to a process that he calls "dialectical development". This law has caused matter to organize into a multitude of forms over millions of years. Galaxies and solar systems, humans and societies are all products of matter organized by the law of dialectical development. When correctly understood, this law indicates that capitalistic economy is the root of exploitation and alienation. Once socialist governments will be established evil will disappear; society will be free from crime and alienation and so forth. Although Marx was an atheist, his theories imply the non-dependence or self-existence of physical matter with its innate law of dialectical development. Matter is "just there" and depends on nothing whatever. The rest of reality is either identical with or dependent on matter. "For this reason" concludes Clouser, we can say that "Marx's theory is based on a religious belief" (2005: 46).

Further considerations

At this point it would be necessary to give a few examples of how religious beliefs shape and have always shaped scientific theorising. It would be possible and indeed very interesting to give dozens of examples from all scientific fields. We could start from mathematics in Ancient Greece, from the crisis caused by the discovery of irrational numbers. Some would then protest that such an example is not valid, as it comes from the days in which religion and science were not yet clearly distinguished. But we could then move to modern mathematics and notice that religion still plays a

significant role in this field today. If mathematics is not a sufficiently "hard" science we could move to modern atomic theory and observe the role of religious beliefs through the works of Mach, Einstein or Heisenberg. We could roam through the fields of biology and psychology, the social sciences and the humanities. We could, if we had much more space available for that purpose.

What can be done in the limited space of this lecture, is to return to Prof. Elaine and pay attention to her analysis of the "turns" in philosophy of science. Yes, in her opinion the different turns aimed at identifying the solid ground, the *locus ordinis* on which certainty and universality could be anchored. The reductionist strategies adopted by the different trends and schools in philosophy of science, reveal the presence of supra-rational commitments of a religious character.

From the point of view presented here it seems reasonable to conclude that philosophers and historians of science, scientists, theologians and all scholars interested in science should pay attention to the impact of religion on science and scholarship.

The purpose, of course, would not be to prove that Christians (or any other group) are always right while the others are wrong.[10] The purpose would rather be to understand the link between the commitment of the scientist (or scientific community) and the scientific hypotheses, theories, methods and results that are proposed. In some cases, this exercise might point out the reasons why certain problems are selected instead of others. It might shed light on the reasons why a certain theory is shaped in a certain way, with certain implications, with a certain scope. This type of inquiry might shed light on the different approaches that the "schools" within a certain discipline may adopt. It might also help revealing why certain states of affairs are interpreted in different ways by different schools.

Conclusion

And so we can move to a conclusion: we have found a way to include religious factors among the factors shaping science. But is this all? Perhaps some of us may start feeling that the implications of this approach are much more far-reaching. They are applicable not only to natural science, but to all the disciplines in which you are

[10] It is well-known that valuable theories are sometimes born from "myths" (Popper, 1963: 127). On the other hand, theories that may be developed within Christian parameters may well be wrong.

working. They are applicable beyond academic disciplines, to fields like art and politics, agriculture, labour relations and society.

Yes, religion counts, it shapes our culture, it shapes life. Yes, this approach opens up for all, especially to Christian scholars, the possibility of living an integral, coherent life, one in which my church and my office are not located in two different planets. And so more questions emerge: where does this approach come from? It is not a new approach but it remains an alternative approach. Twenty years ago, I moved to Potchefstroom because this is one of the places where one can learn about these things. It is not the only place: one can go to Amsterdam, Toronto or Iowa in the USA. But I also knew that I could not have learned about this tradition in Cambridge, Yale, Oxford or La Sorbonne. This is something very important that this university has to offer.

Allow me to conclude with a call not to "sell" your own tradition (Proverbs @@) for one that does not have the same value. We live in times when we are all encouraged to join the big stream, the majority. This has economic reasons, political and psychological reasons. The variety of paradigms is not regarded as enriching but as a threat, despite all the talks about pluralism, listening to the "marginal voices" and so forth. It would be a pity if, in these circumstances, this precious paradigm should be abandoned. For many of us, it would mean losing part of your own identity.

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