

RESEARCH ARTICLE

A brief epistemological discussion of astrotheology in the light of astrobiology

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Abstract

Astrotheology is presented as a discipline of study that manages to complement theology and science. It considers that each one has its own role and that as long as there is no reductionism that wants to monopolize the place of the other, fluid communication between both is possible. Therefore, it is worth examining epistemologically astrotheology in the light of astrobiology. To achieve this, we will highlight the aspect of experience in order to relate it to transdisciplinarity.

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Introduction

Astrotheology is a branch of theology that studies the relationship of God and existence, in a cosmic context. By including the entire universe, which is partly nourished by scientific knowledge, it also does so for the possibility of life in the universe. Astrotheology in its approach to understanding the universe takes into account those assumptions and conclusions that are automatically rejected, or in fact not even considered, in the paradigm of scientific reductionism. As Ted Peters indicates, ‘Scientism, in turn, is often used as an ideology in the public arena, an agenda to reshape culture and society. We need to distinguish between healthy science and bellicose scientism’ (Peters, 2018, p. 20). Thus, the scientific paradigm does not necessarily preclude the legitimacy of not only theological and religious approaches but also philosophical interpretations of reality. With astrotheology, we cannot sacrifice science for theology, that would be to simplify reality and misinterpret it. Therefore, it is imperative to delve into the epistemological aspect of astrotheology in the light of astrobiology, since both have a common element, which is multi, inter and transdisciplinarity, concepts that will be defined in this article.

The aim of the paper is to look at astrotheology in its potential close symbiosis with astrobiology. The perspective we adopt in this paper is a philosophical, epistemological one. To achieve this, we will focus on the fourth aspect of faith that studies theology, experience: ‘The theologian thinks about

matters of faith, and in so doing appeals to four sources: Scripture, history (tradition), reason, and experience' (Peters, 2018, p. 28). The latter is a key point to understand the epistemology of astrotheology, since from the transdisciplinary perspective, it is particularly important when giving interpretation and meaning to the object of study in which we find ourselves. To achieve this objective, this work is divided into three parts: interpretation, meaning and astrotheological experience; transdisciplinary parallels with astrotheology; and finally, the conclusions.

We assume that our paper may be of particular value to scientists, primarily astrobiologists. There is no doubt that astrotheology is completely different from astrobiology and in a scientific sense has nothing in common with it. Nevertheless, they share much in common from the methodological point of view and, in part, in the philosophy and sociology of science. Astrobiology is inter- and multidisciplinary. Moreover, astrobiologists work within a certain broad social and cultural context. The main expected outcome of their work, the discovery and confirmation of extraterrestrial life, will probably be the greatest scientific event in the history of mankind. Such a discovery will undoubtedly have an impact on society, on politics, not to mention the obvious impact on culture. Perhaps it will also have an impact on religion and morality. Because of this important broad context of discovery in the case of astrobiology, it is worth outlining the interrelationship between astrobiology and astrotheology despite the obvious differences between the two. In this perspective, astrobiology can complement astrobiology precisely in light of this broad context. Conversely, astrotheology cannot function without astrobiology. Astrobiological discoveries are likely to have a revolutionary impact on the planetocentric and anthropocentric underpinnings of our culture, built on the idea of the uniqueness of humans as well as the uniqueness of life on Earth.

Interpretation, meaning and astrotheological experience

Our world is a world of interpretations. On a social and day-to-day level, we never stop interpreting what we see. We do not have direct access to the world as it is, otherwise, science itself would have ended a long time ago. Even how we imagine and perceive the universe is a certain cultural concept. It depends not only on the measuring devices used and at least their calibration, but also on certain ideas we have about the universe and scientific theories. Moreover, there is no complete consensus on the interpretation of observational data concerning, for example, traces of ancient life on various cosmic objects. Despite all the scientific apparatus, interpretation still plays an important role and is an inevitable part of the process of scientific explanation, especially in the case of astrobiology. And if an element of interpretation is indispensable in science, it opens the way for considerations of astrotheology or philosophy. Hermeneutics emerges as a type of activity or art, as we could say, that deals with the interpretation of the world through certain texts, which in the case of astrotheology is about the Bible. If we include the results of astrobiological advances, these could interpret the meaning of life in the universe under a biblical reading.

Thus, the meaning of the world is not something material or measurable. The meaning of things is a matter that is subtracted in an abstract way. The interpretation one has of it depends a lot on it. If the meaning of life in the universe were, for example, something entirely measurable and rational, it would have been found long ago. But the reason focuses on analysing and interpreting the world based on that process. Instead, the idea of telos or sense is one that evokes a whole. The image of a puzzle makes sense when all the pieces fit together, not when one of them is more visible than others. The curious thing about all this is that this totality, when we speak of the meaning of life, cannot be easily described, and must be experienced. This coincides with the fourth aspect of faith that theology studies, experience (Peters, 2018).

If we refer to the scope of the work of science, we will have to concentrate on the scientist as a human being and with respect to his way of relating to his immediate academic environment. Therefore, in order to analyse the sense or telos in science, we would do well to study the assumptions that make up the *Lebenswelt* that makes up the lifeworld of the scientist as a person, and that remains invisible if we allow ourselves to be carried away by the precision of science.

The lifeworld was always there for mankind before science, then, just as it continues its manner of being in the epoch of science. Thus, one can put forward by itself the problem of the manner of being of the lifeworld; one can place oneself completely upon the ground of this straightforwardly intuited world, putting out of play all objective-scientific opinions and cognitions, in order to consider generally what kind of ‘scientific’ tasks, i.e., tasks to be resolved with universal validity, arise in respect to this world’s own manner of being (Husserl and Carr, 1970, p. 123).

It is at this level that we must try to identify the characteristics that make up the scientist’s world of life. This world of life cannot be observed by the methods of the natural sciences since it is not there. Rather, it would be the case of the sociology of science, in which we observe four aspects or characteristics that distinguish the work of the scientist: Four sets of institutional imperatives—universalism, communism, disinterestedness, organized scepticism—are taken to comprise the ethos of modern science (Merton, 1973).

Universalism refers to the fact that in accordance with scientific knowledge and observation, one must seek the truth impersonally in science. ‘The imperative of universalism is rooted deep in the impersonal character of science’ (Merton, 1973). For its part, communism is the body of knowledge acquired by the scientific community, ‘The substantive findings of science are a product of social collaboration and are assigned to the community. They constitute a common heritage in which the equity of the individual producer is severely limited’ (Merton, 1973). It is the common pool of knowledge that science has achieved so far. Regarding disinterest, it is reflected by the humility that scientists should have, since their search for the truth does not intend to put their ego above everything. Motivated to discover the truth, scientists do not seek to privatize knowledge. Finally, organized scepticism is the ability to separate one’s beliefs and opinions in the research process. The scientific institution is impartial and does not attempt to distort the facts.

For its part, if we talk about theology, there are four other elements that would characterize it: writing, history, reason and experience. The first is essential, because it is taken as a reference to the Bible in order to carry out the theological interpretation. The history part concerns the discussion about the possibility of many worlds in theology. Reason implies a philosophical act of analysing science, of employing the critical sense in the interpretation of science through theology. Finally, the experience refers to the possibility of contact with other forms of extraterrestrial life (Peters, 2018). Of these four, the last is the one that has not yet been fully confirmed.

Structural similarities between astrotheology and science (astrobiology)

If we compare the characteristics of the scientific institution carried out by Merton, with those of astrotheology, we could say, considering generalities, that both interpretative dimensions and ways of seeing the world have, in epistemological structure, principles that characterize them, and that they are part of the same task of their respective research fields. For example, when we talk about Merton’s universalism, he points out that we must stick to science in order to achieve true knowledge. As a parallel, the astrotheological characteristic of the writing sticks to the Bible, finding the interpretation it needs through the sacred scriptures.

As for the second feature of Merton’s scientific institution, there is also some resemblance to the second feature of astrotheology. In science there is communism, and it represents the common pool of acquired knowledge. In astrotheology, history can be assumed as the knowledge that has so far referred to life in the universe in theology. In one way or another, both are a common pool of knowledge, each from its field of study.

For both positions, in the third characteristic, parallels can be found. In science, we have disinterest, which is given by the humility that is generated in the impartial search for the truth. Scientific forms are used to be able to access knowledge in a disinterested way. In astrotheology, the use of reason is used so that astrotheology can analyse scientific content in such a way that it can learn from it and interpret it. For this, philosophy is quite useful because it also allows you to be disinterested in order to achieve true or episteme knowledge.

So far, the first, second and third characteristics can be seen as epistemological structural parallels with astrotheology. However, addressing the fourth characteristic in both differences arise. In astrotheology, it refers to the experience of possible contact with other forms of life outside our planet. This is something that has not yet been achieved. In the scientific institution, there is talk of organized scepticism, and it seems that it is an element that would go against astrotheology, because of the sceptic element. However, this can be interpreted in another way, since if there is an extraterrestrial contact, the sceptical way of thinking in science would serve a lot. A scepticism related to a cautious way of thinking. However, Merton himself indicates that this characteristic of science: ‘The scientific investigator does not preserve the cleavage between the sacred and the profane, between that which requires uncritical respect and that which can be objectively analyzed’ (Merton, 1973). In astrotheology the experience is interpreted in a secular hermeneutic way:

Interpreting secular and scientific assumptions in light of a scripturally based faith in the transcendent God of Israel. An astrotheologian belonging to a non-Christian tradition may also benefit from this hermeneutic of secular experience; but its theological meaning may differ accordingly. We welcome multi-religious dialogue on such matters (Peters, 2018).

Considering a possible extraterrestrial discovery, be it in the form of microbial life on Mars, for example, or as communication through radio waves, the experience itself must be interpreted in the light of secular hermeneutics.

On the part of science and organized scepticism, if such an experience were to be given, it would still have to be interpreted, but in this case in the light of science. In both cases, we observe the need to interpret the facts, since they are not given per se, but are found in, say, a paradigm. Here the importance of astrotheology is highlighted, which does not wait for the experience to be theoretically prepared for a possible scenario of experience of discovery of life on other worlds.

For now, as we cannot have experiences of discovery of extraterrestrial life, we have to discuss according to the formulation of mental thought experiments:

Where experience can readily guide us (as it can with abortion) thought experiments may be a poor substitute for deliberations about what it is like to be pregnant and denied (or allowed) a termination. But where experience cannot guide us, something more imaginative may be required, at least until we know better (Milligan, 2016).

For this reason, astrotheology also deals with examining the possible scenarios in which some form of confirmation of life on other worlds can occur. However, there is an important element we must add if we want to help interpret this scenario hermeneutically, and that is transdisciplinarity. This way of doing science is closely related to experience because, as we will see, there is no single way to express it.

Transdisciplinarity and astrotheology

As previously stated, academics in general work under certain parameters and consensus that allow them to carry out the task they need to carry out. However, some of these elements are not directly observable, but belong to the scientific institution as organizational culture, to the world of life. It is as Thomas Kuhn would say:

Scientists work from models acquired through education and through subsequent exposure to the literature often without quite knowing or needing to know what characteristics have given these models the status of community paradigms. And because they do so, they need no full set of rules. The coherence displayed by the research tradition in which they participate may not imply even the existence of an underlying body of rules and assumptions that additional historical or philosophical investigation might uncover (Kuhn, 2012).

Thus, for us to study certain topics in science, such as the possibility of life in other worlds, it is necessary to use the knowledge of different disciplines. However, the way in which knowledge is administered and managed in them will depend on whether it is a multidisciplinary, interdisciplinary, or transdisciplinary approach. It would be appropriate if we started to specify and define what we mean by each one. For this, the definition will be taken from previous research (Chon-Torres, 2021). First, we have multidisciplinary, which is the interaction between different disciplines for a common problem. However, multidisciplinary is still heir to the monodisciplinary reductionist vision, which tries to understand the world from its own area of study, inspired by the Newtonian model. Michael Gibbons and colleagues call it mode 1 of knowledge production:

The term Mode 1 refers to a form of knowledge production – a complex of ideas, methods, values, norms - that has grown up to control the diffusion of the Newtonian model to more and more fields of enquiry and ensure its compliance with what is considered sound scientific practice (Gibbons *et al.*, 2010, p. 2).

This helped to shape and characterize academic disciplines in general as specialized forms of knowing. On the other hand, Odum and Barrett (2004) comment on the multidisciplinary that lacks a greater connection between the disciplines involved, and taking the case of ecology as an example, it required higher levels of interaction, it could be said that our situation maintains a certain similarity.

However, the epistemological nature of astrotheology does not work in this way, this is what Peters lets us know when he tells us that:

For a creative mutual interaction to take place, both research scientists and research theologians need to ready themselves for dialogue. Dialogue is a two-way conversation, a working through of issues that move toward a shared horizon of understanding. Scientists can provide growing knowledge about the natural world in which we live (Peters, 2018, p. 22).

With this in mind, astrotheology does not go on the side of multidisciplinary, much less opts for the path of reductionism. If it is not about multidisciplinary, then is interdisciplinarity the way? What is it?

Orientation approach of one or several disciplines towards the focus of one of them. The ‘leading discipline’ is the principal beneficiary in this approach. The case of the philosophy of astrobiology is an example since it does not produce scientific results but rather the implications or philosophical content of it (Chon-Torres, 2018, pp. 7–8)¹⁸.

If we extrapolate this definition to astrotheology, we can see that there is a coincidence. At this level of disciplinary interaction, it is possible that biblical interpretation guides and acts as the horizon of the corresponding hermeneutics.

A phenomenon is what appears to us, and what appears to us needs to be analysed. What gets said needs to be interpreted in the context of the unsaid. We interpret new phenomena in light of their history; and we interpret what is said with a tone of suspicion just in case some hidden grab for power or hegemony is present (Peters, 2018, p. 31).

Astrotheology can shed light on the theological interpretation of the search for life in the universe. However, I do not consider that it is limited to being only an interdisciplinary activity. In fact, following the definition given by the same author, astrotheology remains open to the experience of possible contact, and it is here where interdisciplinarity finds its limit. In other words, the interdisciplinary approach has a theoretical framework that is already defined, or at least elaborated to a certain extent, but the fact of a possible contact makes it open to the new. This is where the a posteriori nature of transdisciplinarity comes in, having experience as a class point. According to Leavy: ‘Transdisciplinarity is an

approach to conducting social research. Transdisciplinary research practices are issue- or-centered approaches to research that prioritize the problem at the center of research over discipline specific concerns, theories or methods' (Leavy, 2011, p. 20). What also coincides with Mode 2 of knowledge production of Michael Gibbons and co-authors, 'in Mode 1 problems are set and solved in a context governed by the, largely academic, interests of a specific community. By contrast, Mode 2 knowledge is carried out in a context of application. Mode 1 is disciplinary while Mode 2 is transdisciplinary. Mode 1 is characterized by homogeneity, Mode 2 by heterogeneity' (Gibbons *et al.*, 2010).

All this implies an opening of disciplines that coincides with the 'astro-' prefix, which should not be understood only as a star. If not:

Understanding 'astro-' as an amplification prefix, we should expect to see (and are seeing) all sorts of new fields arise. These are not merely subdivisions of the hard sciences, like astrophysics, astrochemistry and astrobiology, but also fields imagining the wider social implications of space research, such as astrosociology, astroethics, astro anthropology, astroeconomics, etc. By doing this, the prefix has an abductive effect on the field of study to which it is attached (Pryor, 2018).

Extrapolating it to astrotheology, we could say something similar, since it requires collaboration between different areas of knowledge. Therefore, astrotheology addresses crucial questions in the context of astrobiology (Pryor, 2018). In such a way that theological hermeneutics can be carried out using reason, as indicated by Peters (2018).

Likewise, the disciplinary nature of astrobiology is well expressed by Charles Santos and colleagues: 'In fact, the degree of cross-disciplinarity and dialogue among the scientists and students involved with astrobiology has been so high that astrobiology could be characterized as truly transdisciplinary and not only as interdisciplinary' (Santos *et al.*, 2016, pp. 251–260). In the context of astrotheology, this dialogue is broadened in the search for life in the universe. If we are dealing with different areas of knowledge, what we would most expect is horizontal communication between all of them, not vertical. If it were vertical, we would go to a reductionism, pretending that one has a certain superiority over the others, and there we would fall into one extreme.

What has been said can be reaffirmed by pointing out some of the points of dialogue in which Christian theology can participate with the search for life in the universe that David Wilkinson points out regarding SETI (Wilkinson, 2018, p. 438). He tells us that theology can help to foresee a scenario of future extraterrestrial contact, as well as it can help us to think about our position on extraterrestrial life, and about the importance of ethics in the search for life in the universe. Understood in this way, astrotheology introduces the aforementioned social, cultural and ethical component – essential parts of the larger context – that astrobiology lacks. Of course, astrobiology itself does not need astrotheology to function properly. On the other hand, it is worth considering enriching it with an astrotheological perspective in the context of the important role played by interpreting, and not only explaining, phenomena in today's science, as mentioned in the introduction.

As for the latter, which would belong to astrobioethics, there is also a transdisciplinary epistemological basis, since the latter:

Astroethics must have transdisciplinary practices in order to enrich itself and propose a broader judgement according to the context where it is applied. As an emergent discipline, it is necessary to establish its philosophical foundations, so that it can rely on a theoretical framework for its awareness as a field of knowledge (Chon-Torres, 2018, p. 51).

The connection with astroethics and astrotheology occurs from the moment in which we cannot avoid considering approaches that come from theology, considering that a large number of the world's population belongs to some type of religion. How will society react to such discoveries? Would religion change? Will it have an effect on nations and politics? (Chon-Torres, 2018). Faced with the eventual

scenario of experience of a contact or confirmation of life in other worlds, it will have a great impact on Christian theology (McMullin, 2000).

But not only on Christianity, but also on all the other great religions that have built their narrative on the centrality of the Earth and man, and the uniqueness of life on Earth. Despite the obvious and unquestionable secular nature of science, including astrobiology, which no one should question, the aforementioned broader context of explanation and the high profile of astrobiological discoveries support the thesis of including in this broad perspective the possible world reaction to the discovery of extraterrestrial life. Religion is still professed by the greater part of the world's population, and, expecting their reaction to the information about the discovery of extraterrestrial life, there are good chances in favour of the thesis that this reaction will be channelled, at least in part, in schemes, imaginations and ideas more or less shaped by the religious worldview.

This means that, epistemologically speaking, astrotheology would be positively fed in either case if we find life on another planet in a microbial way, or if contact is established with extraterrestrial intelligent life.

Given what evidence exists, therefore, we can forecast a relatively favourable disposition on the part of Earth's religious believers toward aliens. As soon as confirmation of ETI is announced, we can forecast that church basements will be readied for a covered dish dinner to welcome aliens into our space neighbourhood (Peters, 2018, p. 205).

The transdisciplinary nature of astrotheology facilitates the assimilation of discoveries such as life in other worlds, including intelligent life. Therefore, unlike the shockwave that Copernicanism and Darwinism implied, in this scenario we see a different scenario and with a positive predisposition:

In fact, while the church struggled at times in these previous cultural shocks, it has found ways of rediscovering a theology which has not only survived but been true to its biblical roots and fruitful in its mission in a changing world. In this way, a SETI shockwave could be seen to be an opportunity as well as a challenge (Pryor, 2018, p. 9).

We could even say that astrotheology will lay the foundations for the way we understand religion in the future. Giving us a reassembly according to the astrobiological needs that arise at the time.

Conclusion

The resulting discussion outlined on astrotheology and astrobiology, results in the nature of the former inheriting the essential transdisciplinary notion in order to establish a dialogue between disciplines in a way that avoids reductionism. In other words, astrotheology presents an opening to different areas of knowledge in its attempt to interpret or hermeneutics about the theological and life in the universe.

From the understanding of the epistemological structure of astrotheology, we can infer that it has a positive predisposition for an eventual discovery of life on other worlds, either in the microbial life form or in the extraterrestrial life form. Astrotheology learns from the past by avoiding similar events regarding Copernicanism and Darwinism. This supposes an important turn for the future of the study of life in the universe from theology.

We also assume that astrotheology is entitled to full participation in scientific discourse, especially in astrobiological research, because of the aforementioned broader context of scientific explanation. This context is not only empirical and theoretical scientific research, but the context of discovery and interpretation. The high profile of potential astrobiological discoveries warrants consideration of the social and cultural context in which the discovery of extraterrestrial life will be information of an undoubtedly revolutionary nature, especially arguably for the religious worldview.

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