Some Theological Reflections on the Anthropic Principle

GEORGE V. COYNE, S.J.
Vatican Observatory
Città del Vaticano

Abstract The Anthropic Principle has made a significant contribution to bringing back into harmony the discordance that has existed since the time of Galileo between the scientific and the humanistic cultures. In the light of this, and while respecting the methodological independence of science, philosophy, and theology, I wish to explore how the Anthropic Principle as a scientific conclusion may be an incentive to theological reflection.

1. The Divorce Between Science and Humanism

One of the principal issues at stake in the Galilean controversy was the methodological independence of science and theology. Galileo addressed the issue in a very specific way in his *Letter to the Duchess Christina*.[1] In a sense both sides of the controversy were at fault, Galileo for not appreciating the hypothetical character of the Copernican model of the universe and theologians for failing to realize that Scripture was not teaching science. While theologians did not respect the complete autonomy of science as a way of knowing, the scientists, characterized by Galileo, respected neither the tension between hypothesis and truth in scientific methodology nor the difficult passage from one to the other through both an inductive process from observations and a deductive process from mathematical physics.

The result of the controversy, although not deliberately nurtured by either side, was a divorce between nature and the human person. In fact, science was intent upon removing the element *human person* from its methods of investigation so as to preserve the objectivity characteristic of the sciences. The two cultures, science and humanism, went their separate ways with little discourse between them.[2]

2. The Anthropic Principle

The Anthropic Principle, first enunciated as such by Carter,[3] has served to mend that separation. Other papers in this publication will have enunciated the

conclusions of Carter in more detail. For my purposes let me simply summ
rize Carter's conclusions. The emergence of human civilization has requir
an extremely fine-tuned combination of physical constants and laws of natu
from the very beginning of the universe in a primordial very dense, very h
state and throughout the evolution of the universe. The so-called weak versi
of the Anthropic Principle simply sees this as an observational effect and,
fact, it would be more meaningful to call this version the Observer Princip
We observe the universe to be fine-tuned because if it were not fine-tuned
would not be here to observe it. In this version the Anthropic Principle
simply one of the many selection effects that observers must cope with in ev
uating the data they obtain from observations. On the other hand, if one p
ceeds beyond the recognition of the fine-tuning as a selection effect and da
to ask the question *why*, one enters into the realm of the so-called stro
Anthropic Principle, whereby one seeks to explain the origins of the fine-tu
ing and the reasons for the precise values of the many fundamental consta
and for the laws of nature. As we shall see, it is difficult to do this with
entering into a dialogue with philosophical and theological considerations.
to the present the fundamental constants have, for the most part, only empi
cally determined values. There is no fundamental physical-mathemati
model from which they can be derived. There is no unified theory wh
explains all of them. They are simply found from observations to have the v
ues that they have and even a slight change in them would exclude the evo
tion of the universe to human civilization.[4] By using the words Anthro
Principle to denominate his conclusions Carter obviously insinuated so
kind of finality in the evolution of the universe leading to human civilizati
Whatever might be the cosmological model used to explain that finality, b
real or apparent, we are inevitably invited to philosophical and theologi
reflections.

3. Response to the Anthropic Principle

Since the Anthropic Principle, at least in the strong version, leads to investi
tions which strictly transcend the methodology of science, many scient
simply reject it as not susceptible of scientific enquiry. Others see it as indi
ing a certain intrinsic finality in nature but without reference to the origin
such a finality. Still others from a religious persuasion see it as indicativ
the existence of a Supreme Being who created, among many other possib
ties, a universe in which human civilization would emerge. There are fin
those who, prescinding from any philosophical or theological considerati
simply reject the Anthropic Principle as of no value to science, since it can
ther predict testable conclusions nor assist in the planning of research
grammes leading to a further understanding of the universe. While I must c

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cede that a predictive character appears to be lacking, the Anthropic Principle has certainly provided an incentive for research in cosmology.[5] Furthermore, and perhaps more importantly, it has reinserted the human person into the continuing search for a total and comprehensive understanding of the universe. While certain aspects of this reinsertion may transcend the strict boundaries of what are the proper object and methods of scientific enquiry, it is not obvious that all aspects may be so excluded. At any rate the Anthropic Principle certainly provides an invitation for a serious dialogue among scientists, philosophers, and theologians.

4. The Encounter of Theology and Science

As an example of how certain scientific conclusions may influence theological reflections, I would like now to investigate how the various cosmological models proposed in response to the Anthropic Principle might contribute to elaborating the religious concept of God. As an object of religious enquiry and of faith God is the supreme mystery. Nevertheless, the religious person believes that God has spoken of himself to the human race through the prophets, the patriarches, and for the Christian believer through his Son. This self-revelation of God is found in religious traditions and in the holy books. Theology is properly speaking a science (in the wider sense of that word), a way of knowing, with its own rigorous methodology. Through such disciplines as literary analysis, philosophy, linguistics, etc. it studies religious traditions and the holy books in order to discover religious faith and the object of that faith, God. I would like now to confront the concept of God derived by theology with the Anthropic Principle derived from scientific enquiry. To be more specific, I wish to address the question: Among the various cosmological models proposed in response to the Anthropic Principle, is there one which is more consistent with the concept of God derived from theological enquiry? From the very beginning of these reflections it is necessary to establish two points:

(1) of the many cosmological models proposed there is none yet which even approaches being definitive;
(2) between cosmology and theology we are looking for consistency and not for definitive or determinative concepts or, much less, for proofs.

5. The Knowledge of God in Religion

How does the theologian arrive at a concept of God? We find ourselves immediately in an epistemological dilemma. By definition God is mystery and

unknowable in himself. The only way that we can approach a concept (is by the negative way,[6] that is by taking that which we find from our experience to be good, beautiful, and true in ourselves and in the world us, stripping off (denying) the imperfections that we experience an attributing the purified attributes by analogy[7] to God. Furthermore, as mentioned above, God has spoken to us of himself, and so we can in what he has said to us through religious traditions and the holy w always however using the negative way. The religious traditions hav experienced by and handed down by human beings; they are, therefo lible. The holy books have been written, handed down, and read by beings; they are, therefore, fallible. In order to arrive at the source, at t who spoke, we must study in a rigorous and scientific way those traditi those writings. We must, in other words, understand the human transı of what God said in order to arrive at the God who is speaking. We mus the transmission of its human imperfections.

As an example of the negative way let us now consider a fund attribute of God. He is free and is, in fact, the source and foundation of dom. From the fullness of his freedom he has created the universe formed the human being to his own image and likeness;[8] he has loved t ation and he chose a people to whom he sent his own Son. These are the fundamental ingredients of Christian belief in God. On the other the exercise of his freedom God is not arbitrary; arbitrariness is a de choose by whim and fancy without sufficient reason and motivation coming of God. In the Scriptures and in religious traditions God is sor seen in this way. One must, therefore, while preserving the primordial tation, many times in story form, of God's freedom, purify the presen its negative and imperfect characteristics. In brief, one must apply the way.

6. God the Creator and Cosmological Models

In religious thinking the concept of God the Creator has always beer the risk of presenting God as choosing in an arbitrary manner. The the creation in the Book of Genesis are a primary example of this. I the Genesis stories really intend to present a much more fundamenta teristic of God, namely that he is the saving and redeeming God. G really saying that the same God who saved mankind is the God wh the world, and that, in fact, his creating is a salvific act. Genesis is interested in how God created the world, even though it presents stor of them with common origins in other contemporary cultures, to sho creating God is loving and salvific.[9] Nevertheless, it is difficult to e

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fact that from the presentation in Genesis and throughout religious traditions there is a certain arbitrariness that creeps in to the concept of God-Creator. Let us, therefore, proceed with the task of attempting by the negative way to purify the concept of God-Creator, from a certain inescapable character of arbitrariness by confronting it with the various cosmological models brought forth to explain the Anthropic Principle.

These cosmological models can be divided into two general classes: those which speak of a single universe, in which of course we live; and those which speak of many universes, each of which arises from different initial conditions which determine the values of the constants of nature and the operative physical laws. In this latter case, it is generally supposed that all of those universes which are not self-contradictory (in which the various combinations of constants and physical laws do not defy the principle of contradiction) have actually been realized.

The single-universe cosmologies are several, all of them based on an initial Big Bang, which, in various forms, is up to the present the best explanation of existing observational data. One such cosmological model is that of Stephen Hawking in his book: *A Brief History of Time, From the Big Bang to Black Holes*.[10] From quantum gravity considerations Hawking comes to the conclusion that space-time forms a closed but unbounded surface, and that as such it requires no initial boundary conditions.[11] Hawking says in effect that the only boundary condition is that there are no boundary conditions. Thus the fine-tuned combination of constants of nature and physical laws which eventually led cosmic evolution to the emergence of human civilization is due to nothing other than the inevitable consequences of quantum gravity. Thus, according to Hawking, it is not at all necessary to consider a God-Creator. God is not needed to explain the universe; he does not exist. Leaving aside the purely scientific evaluation of Hawking's theory (very much contested among cosmologists), it is important that his conclusion be evaluated in terms of the principal argument of this paper, namely the confrontation of science and theology, or more specifically, the dialogue between cosmology and theology arising from considerations of the Anthropic Principle. To deny the existence of the God of religious belief on the basis of a scientific theory is a lamentable confusion of two independent ways of knowing. The God of religious belief is not an initial condition, nor even the initial condition, for the existence of the universe. Should, therefore, such a scientific theory really establish that initial conditions are not required, there would still be grounds for science to either affirm or deny the existence of God.

All of the other models of a single universe require the determination of initial conditions from which a certain combination of constants of nature and physical laws came to be so that human civilization evolved. In all of them it is

difficult to escape the notion of an arbitrary choice on the part of God, Creator. It is required, for instance, of God that he has chosen a multitud precise values for physical constants in such a way that, had he chosc slightly different value for one constant or other, the evolution of human c lization would not have been possible. God would be, to put it in more pe trian and vivid terms, somewhat like a master cook whose pinches of sugar, paprika and other ingredients are just right so as to produce the pudd human civilization. It appears to me that this inevitable inclination to a cer arbitrariness in the religious concept of God-Creator could be removed onl the appropriate cosmological model had built into it all that was necessar explain scientifically the actual combination of physical laws and constant nature that we observe. God would, in such a model, not be needed to se the ingredients. This is apparently what Hawking attempts to accomplisl his model derived from quantum gravity considerations. The religious thi might, of course, be tempted to see this as a threat to the very existenc God, or at least as the establishment of a solipsistic God, completely divo from the universe. This could only be the case if one seeks to find God thro science or seeks to understand the universe through religious thought alonc either case, as we have noted above in criticizing Hawking, there is crass c fusion of epistemologies. On the other hand, if one respects the indepen espistemological methodologies of science and theology, but seeks none less for a unity in the human understanding of all reality, then it appears to that the understanding of God's freedom in the context of single-universe mologies is more compatible with the type of model proposed by Hawking

In considering the many-universe cosmologies it appears that one m arrive at an even more profound compatibility between the religious con of God-Creator and scientific theories of the origins of the universe, in sense that God would not be seen either as an arbitrary creator or a solip with respect to creation. There are two classes of many-universes: thos which the universes exist simultaneously and those in which they exist suc sively. For the purposes of this paper I wish to describe briefly one typ each of these two classes. The many-universes could have been born fron initial chaotic state from which there was such a rapid inflationary expan that the various parts are not able to communicate with one another. Since t cannot communicate among themselves, they can justly be called separate verses. Since they have their respective origins in an initial chaotic state, t each have a different combination of physical laws and constants of nat Since there are many, if not an infinity of such universes, it is statistic understandable that human civilization exists in one or more, but not in al them. Thus the explanation of the Anthropic Principle, even the strong sion, req[redacted]intrinsic finality, but has a natural explanation in statist

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considerations. I should remark that many scientists consider this version of many-universes, since by definition the many-universes are not verifiable (they are not inter-communicative), to be a non-scientific theory since it does not respect the strict rigours of the scientific method. Another way of obtaining many-universes is by a succession of Big Bangs, that is a series of pulsations in which each cycle of expansion and contraction represents a separate universe. According to the initial conditions at the beginning of each expansion, diverse combinations of physical laws and constants of nature are realized. Again the Anthropic Principle is explained by statistical considerations.

Although further reflection on this issue is surely required, it appears to me initially that the many-universe cosmologies, as compared to the single-universe cosmologies, are more compatible with a God-Creator who is neither arbitrary nor solipsistic. The religious concept would be, for instance, of a God who would have seen his image and likeness emerge in one or more of the many-universes and he would have marvelled, loved, and taken special care of it as he told us he did in his self-revelation in Scripture and Tradition.

7. Further Considerations: Cosmology and Theology

I conclude here, obviously only at the beginning of what could be a rich encounter of theological thought with cosmology. I would like to list, but only as an example, further considerations which might be of interest to those who are much more competent in these areas than I am:

1. How can we express in more detail the concept of God-Creator in terms of either the single-universe or many-universe cosmologies? We have used such words as *see, marvel at, love, have special care for, etc.* Although we wish to avoid having a God who is either arbitrary or solipsist, it does not appear that the above considerations are adequate to express the rich concept of *to create*.
2. How can we preserve the doctrine of a special intervention of God in the creation of the human being[12] without compromising the notion of a free but not arbitrary God in relation to many-universes?
3. If human civilizations exist elsewhere in our universe, or even in other universes, would the Son of God be also incarnate there? Would he have become incarnate among us even if there had not been an original sin?[13] If there were more than one incarnation, how are we to preserve the defined trinitarian and christologican doctrines?
4. In the case of a single universe, how are we to understand the relatively limited time span of a human civilization determined by the ageing of the central star of a planetary system?

In conclusion, I believe that it is quite clear from such consideration above that the Anthropic Principle has not only been a stimulus to rese cosmology but that it also provides an exciting point of encounter b theology and the sciences and has surely served to reintegrate the human being, which for centuries was excluded from the physical scien

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