

## THE ENIGMA OF EXISTENCE

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### *Abstract*

Why is there a universe rather than nothing? And if there is a universe did it have to burst into being through the Big Bang? And if so, will the answer to the question: what caused the Big Bang? eventually be discovered, or will it remain a mystery forever? Or is there nothing mysterious about it at all? Is the suggestion that the Big Bang was a result of a divine act simply false, or devoid of meaning? The main argument of this essay is that a considerable amount of clarity will be achieved if we realise the radical difference between the kinds of hypothesis that are legitimate to account for events *within* the universe and events accounting for the very *existence* of the universe.

### I

The question why there is something rather than nothing has exercised the great minds of all generations ever since Aristotle. Nowadays, when there exist certain theories about the birth of our universe which enjoy at least indirect support from the findings of astrophysics, the debate concerning the ultimate hypothesis which would explain the nature of the conditions which brought the universe into being has grown in intensity.

At present a large number of cosmologists tend to agree that the observable evidence – including the rate of expansion of the universe and the background radiation – justifies the hypothesis that the universe sprang into existence through what is called the Big Bang. Consequently, a frequently asked question concerning the origin of the universe is: what made the Big Bang happen?

Several scientists have emphasised that it is not merely the case that we have been unable so far to identify the causes that brought the universe into being, but we shall never be able to do so. The eminent chemist Cyril Ponnampereuma, for example, wrote:

Scientifically we conclude that our universe began about 15 billion years ago, but we must recognise the mathematical uncertainties about the point which prevents us from finding out what may have happened before the Big Bang.<sup>1</sup>

John Horgan, author of *The End of Science*, writing most recently in the Op Ed section of the *New York Times*, July 16, 1996, also claimed:

... the biggest question of all: Why is there something, rather than nothing? Unfortunately scientists have even less hopes of solving this riddle than literary critics have of deciding once and for all, what Keat's 'Ode to a Nightingale' really means.

Some religious thinkers have conjectured that the perfect Being who had the requisite power has, owing to His great benevolence, brought about the Big Bang by divine decree. In His omniscience He knew that the laws He legislated for nature are such that they are bound to bring about the existence of sentient beings who are capable of grasping the idea of a deity and are given the opportunity to enhance their level of spirituality through a freely willed, God-centred life.

Many scientists have not found the suggestion of what they call 'theological creation' illuminating. Indeed, some find it altogether repugnant. For example, John Maddox, the former editor of *Nature*, in 1989 went so far as to claim that the Big Bang hypothesis does not permit the discussion of the crucial issue of the universe's origin. Hence Big Bang cosmology must be judged to be inadequate since it implies the absurdity that theological creation is the only suitable explanation for why we are here.

Maddox does not explain, nor does he need to explain, why the theological creation is too absurd to deserve consideration. Beliefs that spring from one's innermost visceral feelings are not subject to rational discussion. What one might ask, however, is: why discriminate against the Big Bang theory?; why should we not deem some of the alternatives to the Big Bang theory – e.g. the Steady State theory – equally inadequate? According to this theory the universe is expanding yet maintains its constant density through the continuous creation of matter. Bondi and Gold, the originators of the theory, emphasised that the new

<sup>1</sup> Cyril Ponnampereuma, 'The Origin, Evolution and Distribution of Life in the Universe', in C.N. Matthews et al. (eds.), *Cosmic Beginnings* (Chicago: Open Court, 1995), p.106.

matter is created not from radiation, nor out of anything that pre-exists, but out of nothing and from nowhere. Maddox's inability to accept the Big Bang theory is most likely based on his refusal to contemplate the instantaneous emergence of a universe with its enormous amount of energy, which seems to be a gross violation of the principle of causality and of the principle of conservation of matter. But the Steady State theory postulates the equivalent of such a physically impermissible process, except that according to that theory the immense amount of energy we have at present is the result, not of an instantaneous explosion, but of a very long incremental accumulation.

Still, one might claim on behalf of Maddox that the anomaly presented by the Steady State theory has at least one of the major features that characterise all laws of nature: the process maintaining the steady state is essentially a regularity; and it goes on all the time. In addition it exhibits pattern repetition, which is what lawful behaviour means; the rate of matter creation varies according to a fixed law. The amount of new matter always equals the amount needed to counteract the universe's drop in density due to the expansion, so an appropriate amount of matter is always created.

Experts on our topic are divided mainly into two classes: (a) those who, like Maddox, regard the Big Bang as offending too much against traditional scientific principles, and hence cannot bring themselves to accept it; and (b) those like Paul Davies, who wrote:

... if the universe came into existence suddenly at some particular moment in the past, then the first moment of time has a singular quality. What can one say about the 'join' between non-existence and existence?<sup>2</sup>

Davies too regards the theory as very odd. Apparently, however, that seems to him not a sign of its intrinsic absurdity, but rather as a sign that the theory is incomplete and awaits qualifications. Davies does not by any means reject the possibility that something beyond physical law – something supernatural – has to be invoked at time  $t = 0$ .

Adolph Grunbaum seems to have adopted a radically different approach to the matter. Grunbaum, who is one of the fiercest

<sup>2</sup> Paul Davies, 'The Mind of God', in J. Hilgevoord (ed.), *Physics and Our View of the World* (Cambridge: CUP, 1994).

opponents of theological creationism, agrees with Maddox's position inasmuch as he too regards theological creation as too absurd, indeed incoherent, to serve as a candidate for explaining anything. On one matter he differs sharply from Maddox, however, and from practically everybody else who discusses the subject. He castigates Maddox and half-a-dozen other writers who believe that the Big Bang theory opens the door to supernatural elements in natural phenomena. In fact, Grunbaum insists that it is altogether incorrect to suggest that *any* explanation for the origin of the universe invites or would permit the introduction of supernatural elements, and also regards it as a profound mistake to think that the origin of the universe is inexplicable. The genesis of the universe cannot be inexplicable simply because it requires no explanation whatever! The Big Bang occurred because it had to occur: there is a law of nature which demands its occurrence.

Grunbaum gives several arguments against those who are worried by the fact that the Big Bang violates the principle of causality as well as the principle of the conservation of energy (as it postulates that an immense amount of energy suddenly filled the universe *ex nihilo*). I shall cite only one of his arguments which I regard to be the most astounding. At one stage he uses an historical example to show how misguided this kind of worry is. Grunbaum reminds us that according to Aristotle constant external force was required to maintain uniform motion. However, Newton has laid down his First Law that uniform motion never requires an external force. Why did Aristotelians not reply – asks Grunbaum – that if in the absence of all external physical forces bodies keep moving then it must be due to supernatural intervention? Aristotelians were smart enough to realise that if there is empirical evidence for a hypothesis (e.g. for the First Law of motion) then that is a natural hypothesis to believe. Conclusion: A universe coming into being from absolutely nothing, just like uniform motion in the absence of no force whatsoever, is a natural phenomenon that warrants no puzzlement and requires no explanation.<sup>3</sup>

To draw a parallel between the First Law of motion and the origin of our universe is, however, based on a profound misunderstanding. First of all, imagine that it was indeed the case that

<sup>3</sup> Adolph Grunbaum, 'Creation as a Pseudo-Explanation in Current Physical Cosmology' *Erkenntnis* 35 (1991), pp. 233–54.

the law of inertia appeared to scientists to be a violation of the law of causality. Surely they would have been highly perturbed. After all, long before it was explicitly formulated, scientists believed in the uniformity of nature. Consequently, they would not have contemplated the possibility that the law of causality held almost in general with one exception, namely that uniformly moving bodies were exempt from it. Inevitably, therefore, they would have chosen to pursue one of two possible lines: (1) they could have concluded that the principle of causality had been refuted and it was a mistake to hold it to be a valid principle in any context; or what is much more likely, (2) they could have concluded that the phenomenon of uniform motion needed closer study so that we could discover the reason why it constituted no violation of the principle of causality.

Option (1) would be taken only under higher exceptional circumstances: scientists are reluctant to abandon such a deeply entrenched principle as the principle of causality because of a single, seeming counter-example. A very clear illustration of choosing option (2) is provided by the way that scientists dealt with the problem presented by the sun before the beginning of this century. None of the known fuels could maintain the sun for more than a few hundred years. Yet the sun has been radiating enormous quantities of energy for thousands of years without any appreciable weakening. Rather than concluding that the principle of the conservation of energy was ill founded, physicists chose the alternative of declaring their ignorance of the source refurbishing the sun's store of energy. With Einstein's theory the mystery was solved: the sun's capacity to go on shining amounts to no violation of the law of energy conservation. Its energy is generated by nuclear fusion which is a process that converts a small amount of mass to an enormous amount of energy.

Newton's First Law does not violate the principle of causality either. The French physicist D'Alembert long ago pointed out that the law of inertia was obviously true and thus did not require any empirical evidence.<sup>4</sup> I believe D'Alembert is vindicated by the fact that a change in spatial position is not a genuine change, but what is commonly called a Cambridge change. Briefly, a Cambridge change may be defined as follows:

<sup>4</sup> Jean D'Alembert, *Traité de dynamique* (Paris, 1921), Vol. 1, pp. 3-6.

an individual  $i$  undergoes a Cambridge change at time  $t$  if even the most meticulous observation confined entirely to the region occupied by  $i$  will find  $i$  indiscernible from what it was just before and just after  $t$ .

Or, as Andrew Brennan writes,

[Cambridge changes] are not the sort of changes we can discern just from inspecting the object concerned in isolation from everything else.<sup>5</sup>

(A paradigm of a Cambridge change is when Xanthippe – unbeknown to her – becomes a widow. Xanthippe does not undergo a real change since even the most meticulous observation confined entirely to the region of space occupied by her cannot detect it; also her transformation leaves her causal powers entirely as they were before. The event had its causes but these were not adjacent to her body.) A change in velocity is of course not a Cambridge change since it is accompanied by a change in momentum. A uniform change in  $i$ 's spatial location, on the other hand, has no effect on its causal powers. Also, it is universally the case that no cause needs to act on a particular to make it undergo a mere Cambridge transformation.

This is a crucially important point worth further elaboration. Consider briefly the principle of the uniformity of nature (or what Lucas calls 'the inefficacy of positions in space and time'). The principle is associated with the name of J.S. Mill, who taught that it makes no difference to the properties of physical particulars at what point in time or at what point in space they happen to be located. It is radically different in the context of genuine properties. It makes a lot of difference to several properties of a substance whether, for instance, its temperature is at 0°C or at 1000°C. Or, as our contemporary Nobel laureate Eugene Wigner said:

given the essential initial conditions, the result will be the same no matter where and when we realise these . . . if it were not so . . . it might have been impossible for us to discover laws of nature.<sup>6</sup>

Furthermore, if particulars A and B are not absolutely indiscernible, A and B are not identical. Yet C and D may exist

<sup>5</sup> Andrew Brennan, *Conditions of Identity* (Oxford: OUP, 1988), p.25.

<sup>6</sup> E.P. Wigner, *Symmetries and Reflections* (Bloomington: Indiana University Press, 1967), p.4.

millions of years apart or occupy regions of space separated by many light years, but if they otherwise have all their genuine properties in common they are merely numerically distinct but still qualitatively identical. Thus differences in spatial or temporal location are not genuine differences and changes in those locations are not substantial events requiring causes.

## II

Let us for a moment go along with the idea that causes may be superfluous even for the most substantial events: that even an entire universe may spring unaided into existence out of nothing, and that the law of the conservation of energy need not apply to a process which is required to take place by a law. Does it then really follow that we have simply nothing that needs explanation? When any new law is discovered do we not feel entitled to ask for an explanation? When for instance Orsted discovered the law that a magnetic needle suspended parallel to an electric current carrying wire will rotate 90 degrees, physicists were very keen in trying to explain this law. This is how the entire science of electromagnetism developed. We would still be very anxious to know, why did this universe happen to be actualised and not one of the infinitely many equally possible universes? And there is, of course, the even more basic question, namely, why there is anything at all? J.J.C. Smart has explained very clearly why that question is a very serious one. He writes:

I require a metaphysical postulate of the simplicity of the universe . . . The more we find simplicities (including regularities and symmetries), the more faith we come to have in the metaphysical postulate.<sup>7</sup>

Though many philosophers regard the principle of simplicity as a mere methodological rule, most scientists tend to agree that it is an ontological principle. Indeed Newton, Einstein, Wheeler, Feynman and many others have explicitly expressed their fascination about the incredible simplicity which underlies the complex phenomena. Several leading scientists firmly believe that sooner or later we shall be able to formulate The Theory of Everything (of which Wheeler said that it will turn out to be

<sup>7</sup> J.J.C. Smart, 'Laws of Nature as a Species of Regularities', in J. Bacon et al. (eds.), *Ontology, Causality and Mind* (Cambridge: CUP, 1993), p.156.

astonishingly simple). That fact is an important manifestation of the attitude of leading scientists. Thus it is highly relevant to our present discussion that, a few pages later, Smart says;

... the simplest universe is the null universe, so it is a mystery why there is anything at all.<sup>8</sup>

And he adds:

We . . . crave to know why anything exists at all. But it is not possible, so far as I can see, that [this] craving could be satisfied.<sup>9</sup>

Thus Smart – as devout an atheist as Grunbaum – would agree with Grunbaum that theistic explanations are to be banished from empirical enquiries; nevertheless he feels that it is highly puzzling that there is an enormously big, immensely rich, vastly variegated universe instead of the incomparably simpler situation of nothing. Smart, unlike Grunbaum, regards it as natural that we should wish – nay we should crave – for the explanation of this deeply intriguing fact.

### III

One might be wondering why those writers who so firmly reject the idea of theological creation cite reasons like the absurdity of the whole notion of a divine being, when it seems that they could have cited a more decisive argument for divine action's not playing a role in the physical sciences. After all, many and perhaps the majority of scientists are agnostic. In other words, they feel that there is no convincing reason why one should believe. I do not know many who go as far as equating theism to an absurd statement like 'Some flowers are red but have no colour'. Thus the question arises, why not attack the theological creationist by referring to the fact that in the last couple of hundred years even the most pious theists refuse to admit divine interference as a substitute for scientific explanation?

For example, physicists were stunned by the negative results of the Michelson-Morley experiment. That experiment was done in the most impeccable manner, every possible source of error was assiduously avoided. Why then did the outcome give no indication

<sup>8</sup> Smart, 'Laws of Nature', p.159.

<sup>9</sup> Smart, 'Laws of Nature', p.163.

that the earth is moving through the ether by a velocity of any magnitude? The bewilderment was acute enough to prompt a great variety of attempts to invent some explanation.

Let it be sufficient if I mention Fitzgerald who made the most famous as well as strangest of all suggestions. His claim – which was subsequently put into mathematical form by Lorentz – was that the ether wind puts pressure on a moving object causing it to shrink in the direction of the motion. The amount of shrinkage was postulated to be exactly of the amount needed to make it appear as if there was no motion through the ether. Most scientists found the theory far too strange. Eddington quoted a verse from Lewis Carroll's *Through the Looking Glass* to ridicule it. I am only referring to this famous historical incident in order to show that even in a situation where some scientists saw fit to postulate extremely odd hypotheses, no one is known to have come forward to offer a theistic hypothesis.

The evidence is overwhelming that all scientists assume that all events are produced within the framework of immutable, and, in principle, discoverable laws. Supernatural factors are under no circumstances admissible into our system of scientific laws.

In fact, it is very important to realise that there are compelling reasons why the abovementioned principle must be obeyed. The first decisive reason is that a catchall explanation is no explanation at all. A catchall explanation may be defined thus:

Suppose an explanation schema *S* has been advanced to account for the explanandum *E*. If it is evident that the same *S* could explain just as well a contrary of *E*, *E\**, then *S* is a catchall explanation.<sup>10</sup> Hence it is not valid either to explain why *E* is true when *E* is true, nor why *E\** is true when *E\** is true.

It should now become obvious why explanations invoking divine interventions are unacceptable. If the puzzle of the earth's seeming lack of motion were permitted to be attributed to a divine decree than if the Michelson-Morley experiment had any other anomalous outcome like showing that the earth was moving ten times as fast than previously estimated, we could just as well attribute that to divine will. Thus the reason why the divine will is

<sup>10</sup> Paradigm example: taxes rise sharply and economists explain it resulting from the government's hare brained fiscal policies. Later when there is a drastic drop in taxation (followed by cuts in social spending) the same economists attribute to precisely the same hare-brained policies.

not permitted to play any role in scientific explanations is not so much because it is a dissonant, alien element, but because it would be a catchall, vacuous explanation. Obviously, a genuine explanation cannot be produced before one knows the explanandum, that is, before one knows what phenomenon cries out for an explanation. The vacuity of theological explanation manifests itself in the fact that long before we know what is going to happen the explanation is fully determined: whatever should be about to take place we already know why: because it is the will of God.

Furthermore, the theist, unlike the non-believer, has an *additional* important reason to resist any attempt to introduce divinely mandated phenomena into the system of natural science. Many scientists – regardless of their attitude to religion – have marvelled at the fantastic ingenuity of the way the universe works. It boggles the mind how, starting from nothing but elementary particles and having at its disposal very simple basic laws, it was capable of evolving into such a gigantic, lavish and endlessly complex and variegated system.

To the religious individual all these astonishing aspects of nature serve as confirmation that the universe has been designed by an infinitely powerful intelligence. Only a divine being could figure out how to devise an incredibly simple set of laws which at the same time are capable on their own, without ever needing refurbishing, without any further maintenance work, servicing or tuning up, of ensuring the full functioning of a breathtakingly complex universe.

Obviously, therefore, if at a certain stage this magnificently-devised set of laws required outside help – i.e. a special divine decree to generate some phenomenon – that would be a serious blow to the idea that divine magnificence is manifested through nature's functioning. Thus, a religious scientist is bound to regard the claim, made under any circumstances, that God was forced to resort to 'special legislation' to ensure that a certain phenomenon obtains, as approaching blasphemy.

At this point the issue of miracles arises. Is a theist committed to their denial?<sup>11</sup> The answer is that the function of miracles is not to correct some fault in the working of nature. Its purpose is to plant religious faith into the hearts of Pharaoh or the worshippers of Baal. It is an essential feature of a miracle to startle those who witness it by means of a spectacular event. It achieves that

<sup>11</sup> Professor Paul Helm raised this question.

purpose by sharp deviation from the expected course of events. No miracle is needed to correct some unforeseen flaw in the laws of nature but to instil awe and wonderment into the hearts of sceptics. And indeed one of the leading Hassidic masters said:

It were evil indeed were we our time in such a position that we required miracles to be shown us.<sup>12</sup>

In the last few hundred years we have acquired sufficient knowledge of the wondrous course of nature which is governed by the stunningly ingenious laws of nature. But even earlier the medieval philosopher and theologian Gersonides (1228–1344) stated that:

miracles cannot be of regular occurrence; if natural phenomena and laws were regularly changed by miracle, it would signify a defect in the natural order.<sup>13</sup>

#### IV

Now we are in a position to see why the problem of the origin of the universe is in an entirely different category and is not comparable to any other problem scientists may face. Let us first look at the problem which Smart wrote has been the greatest source of puzzlement for him: why is there such a richly variegated universe instead of – what would be far simpler – absolutely nothing. Now on this singular occasion if the theist's reply is 'Because God willed it' he does not violate the principle concerning catchall explanations. This is so because:

1. If a universe *does* exist there is room for wondering why – for, as we were told, reason would demand that there be none.
2. On the other hand, if there was nothing, then not only would there be no one to demand why – the situation as such would not cry out for an explanation (cf. Smart).
3. Hence it follows from (2) that those who believe that a theistic explanation is appropriate in the prevailing situation, would resolutely deny that precisely the same 'Because God willed it' explanation (or any other explanation) would at all be required.

<sup>12</sup> cf. Louis I. Newman, *The Hasidic Anthology* (New York: Stratford Press, 1946), p.262.

<sup>13</sup> cf. Philip Birnbaum, *Encyclopaedia of Jewish Concepts* (New York: Hebrew Publishing Co., 1979), p.417.

4. Thus theological creationism could in principle not apply to any other situation than in which a universe does exist.
5. Hence the issue of the universe's origin is beyond comparison with any other empirical issue. Here a theistic explanation – unlike anywhere else – is not a catchall explanation. For if indeed the contrary of the actual situation existed, i.e. there was no universe at all, the theist would not offer nor would there be a demand for any explanation.

As to the second argument specific to the theist who has a substantial stake in not permitting supernatural elements to play any role in science: when it comes to account for the ultimate origin of the universe, not only does he feel entitled to invoke divine causes, but he is bound to feel obliged to do so. After all there is a crucial difference between explaining this or that phenomenon in the universe and explaining the very origin of the universe. It would be ludicrous to forbid the theist to bring theology into his account. The theist claimed that each time when facing a scientific problem and eventually finding a solution in purely scientific terms, we witness the sublime power and wisdom of God who was capable of putting together such a perfect self-sustaining system as our universe. But it would make no sense to claim that divine glory would also be enhanced if he had the ability to construct such a marvellous machine without constructing it! The absence of divine intervention once the universe got going speaks of His glory only because it was He who got the universe going in the first place.

I trust it is clear that the purpose of this paper was not to prove the existence of God. The purpose was to show that the acknowledged absurdity of theological explanations for phenomena within an existing universe in no way creates an obstacle to such explanation of the origin of universe. The believer may without the slightest embarrassment propose divine creation as the ultimate solution to the enigma of existence.

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