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A Response to Tipler's Omega-Point Theory

Frank J. Tipler's Omega-Point Theory claims to be a purely scientific theory which adequately accounts for the existence of an evolving personal God who possesses traditional divine attributes and in virtue of whom we enjoy free will, personal immortality, the prospect of resurrection from the dead, and the action of the Holy Spirit in our lives, among other things. Here we present a critique of that theory, concentrating on its principal flaws, which are philosophical, not scientific. They include arbitrarily endowing an abstract geometrical construction (the causal boundary)—which may or may not eventually come into existence—with personal and divine characteristics (through a misuse of language), failing to acknowledge the limitations of physics, and making unwarranted assumptions concerning the character and necessity of life in the universe.

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1. Tipler's Programme

In a series of papers and articles [1–5], and now in a book [6], Frank J. Tipler develops what he calls the Omega-Point Theory, which he presents as 'a purely scientific theory for an omnipresent, omniscient, omnipotent evolving personal God who exists necessarily and who is both transcendent to space-time and immanent to it' [6]. Supposed consequences deriving from it are free-will, personal immortality, the resurrection of the dead, grace and the action of the Holy Spirit, heaven, hell, and purgatory. All of these, it is claimed, emerge as physical-mathematical concepts, or inevitable consequences of them.

As a physicist and a mathematician Tipler demonstrates an active and imaginative control over many areas of contemporary science, particularly quantum field theory, gravitational physics and cosmology, and information theory. However there are glaring scientific, philosophical, and theological flaws in his construction of the Omega Point theory, and particularly in his extension of its argument beyond the physical in an attempt to cover the personal, philosophical, and theological areas of reality.

Many reviewing Tipler's Omega-Point theory have found it difficult to accept, and indeed most find it farfetched (see for example Martin Gardner's comments [7]). Why then the present reconsideration of this theory? This is because on the one hand some writers, including a theologian of major stature, Wolfgang Pannenberg, have taken Tipler's

work seriously [8], and reputable journals and publishers are continuing to accept Tipler's manuscripts on this topic for publication, despite their obvious shortcomings; and on the other, a major publicity campaign is at present being run internationally to promote his book (Ref. [6]). As a result, there is the very real danger that the uncontrolled speculation represented by the Omega-Point Theory will drag both serious scientific research and serious theological research into disrepute in the public eye, and also will damage important new discussions which have recently begun between scientists and theologians.

It is difficult for the non-specialist to 'zero-in' on the fundamental errors in the Omega Point Theory—there is an extensive technical fabric cloaking the theory, which, though questionable at many points, provides the impression of serious scientific scholarship. But the principal flaws are not technical. In this paper we specify major fallacies in Tipler's approach: scientific, philosophical, and theological, leaving aside secondary technical issues (some of which have been answered elsewhere [9]). In the light of this analysis, the Omega Point theory is seen to be based on uncertain physics pushed far beyond the limits of its applicability. Its principal components are grounded in assumptions which are attractive but unsupportable, and in a geometrical-physical construction (the Omega-Point) which is arbitrarily endowed with divine attributes through linguistic misappropriation.

In what follows we review some major reasons why this work should not be considered, in its main contentions, as either acceptable scientific work, or as acceptable philosophy or theology (if we use those terms in their usual sense).

2. The Fundamental Flaw

Tipler's fundamental flaw in constructing the Omega-Point theory is well and primarily illustrated by his characterization of the Omega Point itself. The Omega Point, as Tipler defines it, is a single-point c-boundary (causal boundary) of the universe. Now only very special universes can have a causal boundary which is a single point. It is very unlikely that our universe will develop such an Omega Point. But Tipler concludes that it must possess one on the basis of his assumption that 'life must exist forever' [see Section 5 below].

For life to exist forever, as Tipler defines it, the universe must (according to him) be closed and lack event horizons, thus implying that the c-boundary will be a single point. Such a point will be outside the space-time, but will be its completion in a geometrical sense—for all light rays and particle paths will terminate there. We do not accept his argument for the existence of such a point, but that is not the main issue that concerns us here.

What Tipler does, having assumed it exists, is to arbitrarily endow this single-point causal boundary—an abstract geometrical construction having

certain basic mathematical properties—with living, personal and divine characteristics, which are completely unsustainable. This is characteristic of the principal way in which he goes astray time and again in his argument. To attribute personal qualities, or the qualities of a living being—not to mention those of omniscience, omnipotence and omnipresence—to the Omega Point, is as sensible as attributing such qualities to a mountain peak, to a circle (because it is geometrically perfect), or to a number with special qualities (such as 13, 777, or 3.1415926 . . .). You can do so if you want to, but this step has no relation to the nature of reality: it is quite arbitrary. One could equally well call the Omega Point (should it exist), Nirvana, Heaven, Hell, or anything else vaguely suggested by its geometrically special character—but none of these names would have any real relation to the mathematical construct. To make the point another way, a rock or some other impersonal object may vaguely and imperfectly remind me of a person because of its shape, stance, or behavior. Calling it 'Harold', though, does not turn it into a person.

Having made this step, since the Omega Point is assumed to be the single geometrical completion of space-time, Tipler then presumes that it is also 'the completion of all finite existence' in a way that approaches an absolute metaphysical sense. This is far beyond what is justified on mathematical or physical grounds, and is completely outside what is predictable of the Omega Point from philosophical and theological considerations. It is based on the linguistic step of extending the word 'completion' from one reasonably well established meaning to another, much broader one, that has no logical foundation in what has previously been presented.

Thus Tipler is not careful about how language is used in these contexts; but here careful use of language is critical. By similar moves in Tipler's game, the geometrical or physical application of infinity—as in infinite information and infinite information storage—quickly and uncritically becomes 'omniscience'. The supposition that all information ends up, geometrically speaking, at the Omega Point (which is the completion of the space-time), becomes 'omnipresence'. Omnipotence is close behind. These unlimited qualities are all equally unjustified characterizations of the hypothetical Omega Point.

Tipler then exploits this confusion of meanings to construct his new cosmic animism. The illusion of scientific rigor is strong. However such attribution of motivations and personal relationships, not to mention divine qualities, to a geometrical construction (which may or may not exist) is merely fanciful, in whatever way it may be rationalized. This careless labeling, treated now as if it has an adequate basis, is the faulty foundation for all that follows.

3. The Limits of Physics

A second basic error which underlies Tipler's Omega-Point Theory is the illusion that physics is omni-competent and without limits, either in

principle or in practice. According to him, the goal of physics is 'understanding the ultimate nature of reality.' Thus physics will eventually find God [p.5 of Ref. 6]. In his view, physics is able to deal with all aspects of reality, including the most fundamental. Nothing is outside its purview—neither the personal, the religious, the aesthetic, nor the poetic. If one accepts this, then complete reductionism is the inevitable consequence; this implies, as Tipler asserts in his book, that human beings are finite state machines, and nothing more than finite state machines (p. 31). If this view were really true, there would be no need for any other discipline but physics; physicists would be masters of all disciplines. But, given the rigorous and well-defined methods and interests of physics, which dictate both its success and its limitations, this overstated estimate is illusory.

Though physics is a very powerful instrument for knowledge within a broad range of experience, to presume that it is omniscient and that nothing exists outside its purview is an unjustified and erroneous assumption. If true this would imply, for example, that physics can determine the difference between great and mediocre poetry, can explain the social behavior of ant colonies, or can supplant psychotherapy—obviously unsupported claims. Even within its range of competency, physics is unable to live up to the hopes and expectations we have for it; for example it cannot even convincingly explain the arrow of time or the foundations of quantum mechanics, much less the 'ultimate nature' of gravity, electrons, or anything else (what it can do is give a highly successful phenomenological description of the regularities of their behaviour—a totally different thing). This failure to acknowledge the limits of physics results in Tipler transgressing them, and so allows his fundamental mistake of endowing geometrical and physical quantities and constructions with personal and divine attributes—concepts that are completely outside the purview of physics (to be quite clear about this, consider which laws of physics make statements about love or hope, intelligence or faithfulness, righteousness or evil). For example, the claim is made that the Omega Point will love us. Which are the testable laws of physics that lead to this conclusion? There can be none—for 'love' is not a concept that physics can handle in any way.¹ Consequently the attempt to use the mantle of physics to provide a justification for Tipler's inventions fails.

This claim of the paramount nature of physics is particularly important in relation to Tipler's main substantive methodological proposal—that there is no need for theology, except regarded as a branch of physics. We deal later with Tipler's claims as seen from a theological perspective. The point here is that in fact physics cannot even begin to deal with the subject

¹ The only way we can see that one might try to justify this kind of thing from within a physics framework is through the idea, based on Feynman's approach to quantum physics, that 'all that can happen, will happen' (note that this says nothing whatever specifically about 'love'). If this is the basis envisaged, then in some universes the Omega Point, were it to exist, would hate us, and in others it would be quite indifferent to our existence.

area that is the concern of theology. It has neither the needed concepts nor the analytic methods to do so. Specifically, it cannot deal with particular events regarded precisely as particular and special—it has no interest in doing so. Physics deals with what is generally true—with what can be subsumed under 'laws'. Theology is at least attuned to the particular and to the special as possible channels of revelation; Tipler's analysis makes no room for that.

Related to this failure to acknowledge the limits of physics is Tipler's continual identification of models with the realities they are intended to describe, for example in dealing with the claimed possibility of resurrection of the dead (carried out, he claims, by a hypothetical process of emulating people). He assumes we can have perfect models of extraordinarily complex systems, though no method is known that will produce them even in simple cases; and then mistakes the model for the thing itself. Even in simple physics, that is bad methodology. In more delicate areas of philosophy and theology, it is a fatal mistake.

4. Testability

Tipler claims that the Omega Point theory is testable. Even though at the end of his articles and at the end of his book he admits there is at present no evidence for it, he nonetheless implies it is subject to testing, at least in principle. But when one looks carefully at the major elements of the Omega-Point theory, it is not testable even in principle, either scientifically or theologically—certainly not relative to its key conclusions. The major physical conclusion is that we could never from within the universe (before its end) determine if its causal boundary was indeed going to be a single point; this key component of the theory is thus quite safe from experimental disproof any time before the end of history. And insofar as we can experimentally check his basic assumption that life will continue forever, that assumption is false (see Section 5).

If we choose to disregard this obvious argument, and consider checking the other assumptions observationally, it is clear that we cannot experimentally check the theory's major claims about the nature of the Omega Point at any time before the universe ends; e.g. that some kind of computational process could take place there—after the end of the universe, when space and time no longer exist. *A fortiori* we cannot test the hypothetical process of resurrection; the implication that once this had taken place, the replicas would be conscious in some meaningful sense; and the assumption that the 'resurrected' replicas would then have 'eternal life.'

Insofar as the Omega Point Theory is based on physics, that physics is highly speculative and controversial, relating to the wavefunction of the universe and the many-worlds interpretation of quantum mechanics—which are not testable by any possible experiments. Some weakly related

claims about the nature of elementary particles are testable, but these in no way substantiate the major elements of the theory.

5 Tipler's Assumption About Life

The fundamental flaws discussed already definitively undermine the basis of Tipler's Omega Point theory as a scientific theory. It is nevertheless still worth commenting on other aspects that further demonstrate its lack of credibility. One of these—basic to the rest of his argument—is Tipler's postulate that life must exist forever in a universe which recollapses—and so continues at a future epoch when temperatures diverge to infinity as one approaches the final state.

This assumption, as Tipler presents it, is unsupported on any credible scientific grounds [9]—even though he initially characterizes life in minimalist terms simply as information processing [in later parts of his work he presents information processing as a necessary condition for life, not as a definition of life]. As temperatures increase in the future (if indeed this happens), all possible physical structures which could support the complex hereditary, developmental, and feedback control systems of living organisms will be destroyed as all material is ionized and then nuclei decompose into highly energetic fundamental particles, which continually bombard any incipient structures that might briefly remain. He is thus supposing physically impossible scenarios for this key ingredient of his theory, namely maintaining life in the extreme conditions that would occur in a collapsing universe.

It is this unwarranted assumption which is claimed to lead to the conclusion that the universe must be closed and life must prevent the existence of horizons. This further claim—that life could prevent formation of event horizons so that the Omega Point can form—requires coherent manipulation of the entire universe by living beings! This chain of argumentation is fantasy rather than science.

6 The contradictory character of the Omega Point as God

It is worth indicating briefly how Tipler's Omega Point arguments and speculations contravene fundamental principles of logic and philosophy. The attribution of divine characteristics to the Omega Point in his theory leads to contradictions both within the theory, and with accepted notions of the divine.

The first point is that the Omega Point is supposed to be generated by the laws and by the evolutionary history of the universe and of entities within the universe, instead of generating them. Though supposedly divine, as Tipler characterizes the Omega Point in certain key components of his theory, it has no role in determining those laws or that evolutionary history. Nor does it seem that it ever could have. In fact, as Tipler points out, the Omega Point itself is determined by all the entities in the universe,

which feed information into it. In a sense it is a passive receptacle. How then could the Omega Point be divine in any accepted sense?

But in later parts of the theory, Tipler characterizes the Omega Point as determining all else. He postulates the 'Teilhard boundary condition,' which forces us to have a universe with an Omega Point. This is a way of attempting to theoretically embody his fundamental assumption that life must exist forever (see section 5 above). He then has the Omega Point determining the wave function of the universe, which he later suggests should be identified with the Holy Spirit—which in turn determines everything else! There is confusion and a circularity of argument here, and so a fundamental inconsistency in the basis of the theory—on its own terms. The Omega Point cannot both be determined by and be determining the very same things. Nor can it be both completely active and completely passive relative to the very same realities.

A further inconsistency, related to this, is that Tipler attributes necessary existence to the Omega Point. From what we have seen, there is no way in which that necessity can be logically and consistently understood within his theory, even if his fundamental assumption were necessarily true.

We do not regard these errors as significant relative to the fundamental problems discussed earlier. We point them out because they confirm the rather pervasive inconsistencies in the overall construction of the theory.

7 The Omega Point Theory as Theology?

Considering Tipler's Omega Point proposal from a theological viewpoint, it is strange that, in ostensibly constructing it purely on the basis of physics, he rejects the foundations on which most theology is based, namely revelation and faith (the response to revelation). He replaces these foundations with what physics purports to know of space-time, matter, and information, and proceeds from there. Indeed² he denies the possibility of revelation; although if the Omega Point is able to do as much as he claims—if it is a person, lifegiving, etc.—it is quite unclear why it does not reveal itself in a special way to us who are proceeding towards it.

Theology for Tipler is, as we have also seen, nothing but physical cosmology based on the assumption that life as a whole is immortal [pg. 11 of Ref. 6]. In this analysis, little else seriously counts—the scriptures, tradition, communal and individual experiences of faith and commitment, human history, experiences of ultimacy, prayer and spiritual discernment, prophets and prophetic tradition. Tipler's physical theology has no way of evaluating, appealing to, or incorporating any of these aspects of usual theology. In fact, though he has derived some of his language, concepts, and inspiration from them, in his theory they are all suspect and beside the point. With the power and certitude physics is claimed to offer, these

² Despite his many quotes from St. Paul and other religious figures.

traditional sources of theological reflection are not seen as worth taking seriously.

If we turn from the lack of a solid base of theology to theological content—insofar as that makes any sense—Tipler's Omega Point theory is also unacceptable in many ways. His concept of God—the Omega Point—is, as we have already seen, impoverished and almost unrecognizable, a God who is inconsistently conceived and is at root merely a geometrical construction at the fringes of possibility and of reality. This God does not reveal, redeem, heal, transform, or possess anything beyond what we already have and possess—and in fact, in one characterization of its essence, is itself determined only by that! God is just another object or aspect associated with the universe—at the end of the universe—and cannot even be conceived as existing until the universe has been 'completed'.

On this thinly conceived view, there is no destiny nor meaning to human life or for the universe deriving from the Omega Point. Eternal life and resurrection are just continuations of our present existence, far from what either Christian, Hindu, or Islamic teaching proclaims. There is nothing about sin and its forgiveness, or about salvation and redemption, to be offered, indeed this construction has no ethical content—there is no 'ought' or 'ought not' here. At every stage, Tipler's Omega Point theory is as inadequate theologically as it is scientifically.

8 Personhood and Information

One final aspect of the Omega Point theory is worth a comment. In proposing that the Omega Point would actualize 'the resurrection of the dead,' Tipler identifies this with 'emulation'—total exact reconstruction of a person and his or her history in a computational process.

In hypothesizing this, Tipler assumes that all the information, genetic and epigenetic (for example neurological), that completely characterizes each person is able to be communicated to the Omega Point by physical processes, and then is able to be stored, manipulated, and used by the Omega Point to reconstruct each person. This proposal rests on his thorough-going reductionism—that we are nothing more than finite state machines, which therefore can be easily and exactly copied at every point in their history. This contradicts conclusions emerging from many other realms of science—including dynamical systems, the physics of complex systems, several areas of biology, and neurophysiology.

Additionally, there are a number of impossibilities here. Total information about a person is never available to the exterior of the person—how could an exterior observer determine *all* the brain states of a person by any physically possible means? Furthermore, transmission and storage of the totality of information needed to reconstruct a person completely, even if it were available, is impossible in physical and information terms: *inter alia*, intervening matter and black holes would prevent this. This impossibility

is compounded by where the Omega Point is finally actualized (outside space-time itself).

Thus, disregarding all other problems, Tipler's Omega Point, apart from any other consideration about its nature, is simply incapable of obtaining the needed information by *physical processes occurring in space-time* (the situation envisaged by Tipler). And if it had the information available, the supposed process of reconstruction of a person—by a mathematical structure that does not exist in space-time—seems purely fanciful. Tipler's discussion does not begin to tackle the real problems that would face a biologist or physicist seriously considering such an enterprise.

In this context Tipler seems to have confused infinite information and data storage with omniscience, that is infinite knowledge or knowledge of everything. But the quantity of information, even if it is infinite, does not imply either quality or organization of that information, or that the information is complete concerning all that exists—or indeed concerning any specific aspect of reality whatever. You can have infinite information that tells you very little about anything!

9 Conclusions

We have concentrated on the principal flaws in Tipler's Omega Point theory, leaving aside those of a purely technical nature. As we have seen, his theory involves major errors in attribution, in the use of language, in understanding the character of knowledge relative to reality, in logic and consistency, and in the justifiability of fundamental assumptions. As a result we can see that the Omega Point Theory is far from what Tipler purports it to be. It is really a texture of fancy and illusion created by the misuse of both physics and language. It should not be confused with serious work at the science-theology frontier.

Though our critique has been very negative, there are positive contributions in Tipler's Omega-Point writings. He presents some fascinating perspectives on the universe, physical reality, and their ultimate meaning. And he is one of the few who has begun to consider what the future of the universe may mean for us. If one is capable of sifting the unsupported speculation from what is possibly justifiable, there are some worthwhile and challenging proposals scattered throughout his book and his papers on these topics. For example the technical issue of whether a space-time could in fact exist with a single point as its future c-boundary is an intriguing one.

Perhaps we should step back and consider the Omega-Point theory neither as science nor as theology, but rather as contemporary myth—a New Age story—or as science fiction struggling to find a place for God and persons in the physical universe. Then as such it may have something to teach us about our yearnings and our intuition that, however inconsistently we may articulate it, nothing of value will be lost in the end—life in some full sense will continue forever.

Our critique has supposed the Omega-Point theory is intended to be taken seriously as science and theology, or as an adequate replacement for a rigorous theology. Assuming this standpoint, then as we have shown, it is deeply flawed and quite unsupportable, the argument being inconsistent and arbitrary, with numerous unwarranted conclusions being simply stated as fact; so it cannot be taken seriously in either scientific or theological terms. But perhaps our supposition is unjustified, and we have not correctly identified its literary genre.

References

- [1] John D. Barrow and Frank J. Tipler, *The Anthropic Cosmological Principle*, Oxford University Press (Oxford, 1986), Chapter 10, pp. 613–682.
- [2] F. J. Tipler, 'The Omega Point Theory: A Model for an Evolving God,' in *Physics Philosophy and Theology: A Common Quest for Understanding*, eds. Robert J. Russell, William R. Stoeger, and George V. Coyne, Vatican Observatory, 1988, pp. 313–331.
- [3] F. J. Tipler, 'The Ultimate Fate of Life in Universes Which Undergo Inflation,' *Physics Letters*, B286, 36 (1992).
- [4] F. J. Tipler, *Inter. Journ. Theor. Phys.*, 25, 617 (1986).
- [5] F. J. Tipler, 'The Omega Point as Eschaton. Answers to Pannenberg's Questions for Scientists,' *Zygon*, 24 (June 1989), 217–253.
- [6] F. J. Tipler, *The Physics of Eternity: Modern Cosmology, God, and the Resurrection of the Dead*, Doubleday, 1994, 528 pp.
- [7] Martin Gardner, 'Tipler's Omega Point Theory,' *Skeptical Enquirer*, 15 (Winter 1991), pp. 128–132.
- [8] W. Pannenberg: 'Theological Appropriation of Scientific Understanding: Response to Hefner, Wicken, Eaves, and Tipler,' *Zygon*, 24, No 2 (June 1989), 263–271.
- [9] G. F. R. Ellis and D. H. Coule: 'Life at the End of the Universe,' *Gen. Rel. and Grav.*, 26, 731–739 (1994).

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