

Flipping the *anthropic* *principle* on its head



Albert Fiorino

***To get another view
of 'everything'***

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Revisiting *The Grand Design*

A few years ago, Professor Stephen Hawking, formerly Lucasian Professor of Mathematics at the University of Cambridge and Professor Leonard Mlodinow of Caltech co-authored a book entitled, *The Grand Design* (2010). In the book, they opt to dismiss the need for God, as ultimate creator, which an integrated (weak and strong) *anthropic principle* would support. Instead, they commit fully to the M-theory, which designates a network of theories that separately can account for only a certain set of phenomena, but which together can offer the best approximation to what the authors call “the theory of everything”. This “theory of everything” complies with their espoused “model-dependent realism,” which they describe thusly:

“...the idea that a physical theory or world picture is a model (generally of a mathematical nature) and a set of rules that connect the elements of the model to observations.”¹

This form of realism provides them with a framework within which to make sense out of the various partially valid and yet overlapping theories of reality found in modern physics.

In 2012, I penned a short response focussing primarily on their dismissal of the existence of God as the ultimate cause of everything. To salvage some semblance of relevance and validity to the transcendent nature of human beings, I argued that the arbitrary limits imposed on scientific enquiry, which presumes the ability of human intelligence to go beyond its own constructs, results not in a “theory of everything”, but in a blind, bounded grand theory in progress. Such constructs as mind and the existence of an ultimate subsisting being cannot be excluded ‘willy nilly’ from any genuine scientific enquiry. Both constructs have been elaborated by human beings from their own experience of reality from time immemorial. The fact that a scientific theory has not yet been developed which would satisfy the requirements of Hawking’s and Mlodinow’s model-dependent realism should not automatically dismiss these intellectual constructs from serious consideration in a more encompassing ‘theory of everything’. Perhaps what needs to change, as I will suggest in my closing remarks, is the model-dependent realism and its parameters.

I also approached my first response from a public-policy perspective to make the point that such ‘grand’ human designs do tend to question, perhaps inadvertently, the very foundations of the principles and values which form the basis of public discourse and civil society. In the process, they promote and impose the same limits associated with a model-dependent realism on the ways in which we deal with social reality.

In this second piece on *The Grand Design*, I want to briefly focus on two key elements of book: the authors' adopted model-dependent realism, and the *anthropic principle* whose heuristic potential was not fully considered, I believe, by Hawking and Mlodinow.

Brief background to personal interest in subject

In my early years of undergraduate studies, I had the privilege of taking a course in *Cosmology* given by a former Vice-Rector of Scots College in Rome, the Reverend Dr. John A. Sheridan. He was a University of Cambridge graduate, where he took a Natural Sciences Tripos, possessed an eidetic memory, and suffered from a chronic obsession with the intelligent behaviour of bees. His lectures introduced me to the exciting world of physics and inspired me to personally nurture a keen interest in the field.

Some years later, I encountered another great 'divine'² while researching a topic for my graduate thesis in philosophy in the person of the late Reverend Dr. Eric Mascall. He was a world-renowned Anglican scholar at the University of Cambridge, an Oxford graduate, and an ardent student of the natural sciences. One of his many research interests involved finding common ground for dialogue between theology and natural science, between theological and scientific discourse. It was this interest that led him to write a work entitled, *Christian Theology and Natural Science. Some Questions on Their Relations* (1956).³

During my research, I had the opportunity to examine Dr. Mascall's book closely as a way of getting a better understanding of his epistemology and thus as a means of formulating a thesis topic for my research. In the end, I settled on an analysis of the role intuition plays in human cognition within the context of moderate realism, a philosophical theory of human cognition which Dr. Mascall espoused and defended throughout his entire professional life.

Coming across the narrative on the "model-dependent realism" presented by Professors Hawking and Mlodinow and the defense they offer for it in their book had the effect of transporting me back in time to the discussions I had encountered in Dr. Mascall's writings. And oddly enough the main threads of the debate in which he participated with such contemporaries as Professor Stephen Toulmin, Professor R. B. Braithwaite and others did not seem to have changed. It seems that the scientific community has taken very little notice of that debate. Perhaps Mascall would have judged Hawking's and Mlodinow's description of their approach as a "model-dependent realism" as a sign of progress indicating that maybe scientists are at least trying to get on the right track destined for a real, vibrant, living, existing universe. However, upon a closer inspection of the model, I believe Dr. Mascall would have quickly realized that the model remains captive of the same subjectivism that characterized the scientific thinking of his time.

Model-dependent realism

The model-dependent realism is simply a way by which to describe the M-theory, which Hawking and Mlodinow in the end adopt as the ultimate “theory of everything”—the best possible vehicle for understanding how reality works. They state that their model-dependent realism:

“...is based on the idea that our brains interpret the input from our sensory organs by making a model of the world. When such a model is successful at explaining events, we tend to attribute to it, and to the elements and concepts that constitute it, the quality of reality or absolute truth. But there may be different ways in which one could model the same physical situation, with each employing different fundamental elements and concepts. If two such physical theories or models accurately predict the same events, one cannot be said to be more real than the other; rather, we are free to use whichever model is most convenient.”⁴

Thus, the many models captured under the rubric M-theory constitute different ways by which to visualize a physical event or situation. The reality component of a model hinges upon its predictive ability. Via the predicted event, quantum behaviour or incident, the scientist con-

tends that he or she can affirm the existence of the observed phenomena whose workings were theorized about in the model, very much like when things work out the way we thought they would through the different decision-making models we use in our daily life. Or do they? Does the intelligibility/understanding reside in the predicted event or behaviour or does it lie in something else originating with the actual working of the theory and model? Or does the understanding and implied learning take place through some other still unacknowledged capacity of human intelligence?

In his book, Mascall concludes that scientific models are simply “deductive systems whose function is to co-ordinate and to predict empirical observations”.⁵ For this reason, he argued that necessity in the structure of the model did not necessarily imply any necessity in the structure of the real world which the different models attempt to describe. The models or maps constructed out of physical images or mathematical concepts are simply means which enable the scientist to peer into an ever-changing physical reality. And yet even the countless intellectual discourses and debates about such models and their associated issues beg the question about what can ultimately and sufficiently account for the intelligibility and meaning which infuses them and thus assumed by the involved participants.

I believe that in practice scientists operate on a tacit awareness of this functional view of their models as simple means

through which they glimpse into this ever-changing/-moving external reality. In theory, however, they still maintain that their only hold on that reality is achieved via the predicted events which their models facilitate. The processing of data by the brain, its interpretation of this data and the explanations it puts forward in the form of theories and models remain the product of statistical probability models which at best can only give generalizations about the physical incidents or events being studied. The truth of the “concepts and elements” which make up the modes lies solely in their ability to make accurate predictions about future behaviours.

These scientific protocols very much reflect the problem-solving model found in the behavioural and social sciences and are intimately characteristic of the *functionalism* of John Dewey (1859-1952). From these protocols, the way sensory data from their internal and external environments is processed and from their lived personal experience, human beings draw generalizations, make deductions from them, and create models which they use to guide their responses, behaviour and actions. In a very real sense, based upon the mental mapping that these models help develop, individuals make conscious or tacit predictions about possible behavioural outcomes associated with different choices, not unlike the kind of generalization and predictive behaviours scientists exhibit in the application of their own protocols.

Over time, this *functionalism* found its way into the social sciences and economics wherein it became the focus of researchers interested in the study of decision making. It was within this context that the perfectly rational man of economic theory and subsequent decision-making models were developed. Nobel Laureate Herbert Simon (1916-2001) was a key figure in exploring the various ways in which human rationality behaves. He coined one such way as *procedural rationality* to describe how in its problem-solving 'capacity building,' one might say, rationality/human intelligence creates devices by which to augment its processing and computational abilities. The most obvious example in our times of such a device is the computer and all its technological offsprings.

However, outcroppings of *procedural rationality* can also be intellectual. Thus, scientific theories can also be considered as extensions of *functional rationality* in its efforts to make sense out of the workings of reality in all its visible and invisible manifestations. One could say that this procedural, behavioural model describing the way the scientist proceeds in the practice of his or her craft is simply a manifestation of the same functionalist model found and studied in the social sciences.

But what is the interpretative/basis of the generalizations and explanations which these models provide to the scientists? *Procedural rationality* relies on other forms of rationality to work up its constructs and products. As in the social sciences the current debate calls for the summoning of a

more primary form of rationality to account for the behaviours of the human brain/mind/ human intelligence---meta-contingency models whose own devices for transcending *procedural rationality* will also beg for justification. Meta-analytical/statistical models have been developed to achieve higher levels of generalization and thus of predictability. Still these higher levels of generalizations and predictability cannot themselves provide a justification for the intelligibility and understanding we derive from the ensuing deductions we make from them or from the intelligibility, understanding and reality we ascribe to the phenomena under investigation.

The effect of this kind of reasoning is to make the generalizability achieved through the mathematical modelling synonymous with the conceptual intelligibility and understanding acquired of the phenomena. In other words, our conceptual knowledge of things, persons, and quantum reality is reduced to the generalizations we work up of the observed phenomena in our brains or that we work up through an amalgam of sophisticated mathematical/statistical models.

Many scientists, like Hawking and Mlodinow, would like us to believe that our conceptual knowledge involves nothing more than a processing carried out by an entity whose intelligent activities are the by-product of an evolutionary process of cosmic proportions seemingly aimed at attaining such an outcome. The end-result of such thinking is the *anthropic principle*, which in turn becomes the foundation of

a uniquely scientific anthropology whose main justification is a subjectivism whose only mode of relating to a potentially existing reality is its own procedural contrivances, like Hawking's and Mlodinow's model-dependent realism.

It is quite evident that this view of man makes knowing totally dependent on *procedural rationality* and its mathematical and technological contrivances, completely ignoring the other behaviours which have been solidly documented in the social sciences and which can be ascribed to rationality from scientific behavioural theories. Cognitive theories found in our philosophical traditions, such as MacCall's moderate realism, are a non-starter for Hawking and Mlodinow since they are the result of a kind of rational behaviour which *procedural rationality*, caught up in its triumphs and high levels of public acceptance, has dismissed and disavowed for quite some time.

Models of *procedural rationality*, which aim at creating intellectual or physical constructs by which to extend *functional rationality's* ability for problem solving, presume a higher order activity by which the human mind can derive meaning and intelligibility from the objects it experiences through its sensory apparatus and works up through its imaging capacity. What is important to underscore is that in the end what is understood and grasped is not a generalization but the meaning/purpose/function of the objects being observed, detected or investigated through them.

If scientists choose to see their models and generalizations as close-ended constructs whose only connection to reality is through the predictions of either cosmic or quantum events or incidents they permit on occasion, they will remain forever captive of their own subjective world. As long as they refuse to admit other forms of rationality into their scientific calculus in their quest for a 'theory of everything', they will be left with a limited view of human existence, the 'straw man' reflected in their *anthropic principle* and forever living under the constraints of their model-dependent realism, a mere contrivance of *procedural rationality*.

Flipping the *anthropic principle* on its head

The authors of *The Grand Design* describe *anthropic principle* as "the idea that we can draw conclusions about the apparent laws of physics based on the fact that we exist," that human life came to be in the forms and ways that it can be found

The weak form of the *anthropic principle* states the initiating environmental conditions in our universe were tailor-made for the emergence of human life. In other words, human life as we know it would never have been possible if these initiating conditions had not been present. Human life with all its complexity and potential dictates that these initiating conditions were just right. One could also say then that present conditions will also have a determining impact on what human beings will become.

The strong *anthropic principle* dictates that not only the initiating conditions but also the laws governing them and entire universe were tailor-made to nurture the emergence of human life. With M-theory and its postulation of a multiverse, it is possible to conjecture that initiating conditions and laws corresponding to these different universes could result in other forms of intelligent life forms. As in the case of the weak principle, the strong *anthropic principle* would also dictate the direction of human beings' future evolution.

As an aside, a strict acceptance of the *anthropic principle* (both weak and strong) supports determinism as an integral feature of the structures of reality. Thus, if one were capable of fully understanding all the laws governing the universe and to know all the initiating conditions from which all timelines originate then that individual would be able to predict with certainty the histories of all entities, regardless of their size and nature, in the universe. Both Hawking and Mlodinow seem to have no problem in accepting the determinism that issues from their "theory of everything".

The *anthropic principle* and its underlying scientific anthropology is the only possible outcome of a model-dependent realism which chooses to recognize only the information obtained through the procedural contrivances of rationality as being true and valid. The *anthropic principle* could be said to constitute *procedural rationality's* very own self-concept. Consequently, any other forms of knowledge or rational behaviours such as critical thinking or intuition are excluded at

the outset. In the process, the scientist, trapped in his or her model-dependent view of the world, cannot entertain or ascribe any other higher order activities to rationality and thus a higher, more transcendent role to himself or herself than the one permitted by the model's limiting parameters. It follows that scientists espousing such a form of realism deprive themselves of what they might call the 'luxury' of entertaining any other view of man even though men and women throughout the world, rational entities, do exactly that each day of their lives.

Moreover, what ordinary men and women see when they look at each other is not entities driven by model-dependent versions of themselves, but men and women who think, speculate, dream, fantasize, imagine, design, create, produce, construct, make, behave and act.

And as we are writing this piece, many of these same men and women are witnessing human beings on the verge of momentous breakthroughs: the mapping of the human genome, the creation of artificial intelligence capable of replicating most facets of human behaviour, and the building of more powerful and faster vehicles by which to explore and colonize other planets in our galaxy and beyond.

Many of these men and women also realize that what drove and guided the problem-solving activities which resulted in these outcomes was the light of a more fundamental manifestation of human intelligence which over the years social

scientists have called substantial rationality and which philosophers have known as pure intellect, intuition, a power of mind by which to discern and grasp the meaning, the intelligibility of things. It is a power which pervades all intelligent human activity.

Scientists espousing theories such as model-dependent realism have no difficulty in attributing the role of designer to a computer specialist who designs the architecture of a computer system or an engineer who designs technological contrivances for detecting and plotting the behaviour of subatomic particles. Yet these same scientists have great difficulty in postulating a hypothesis that the multiverse and its seemingly unfathomable and infinite nature have a 'grand designer'.

Likewise, these same scientists have no difficulty in understanding that all the things which men and women produce, from an art piece to the most sophisticated technological gadget, are based on human designs, made with human hands and ingenuity, thereby making these same human beings creators. Despite this fact, such scientists find it repulsive to entertain the possibility that the very fact that things exist in the myriad ways and forms that they do demands not merely a mathematically/subjectively modelled explanation, but a real one. I suspect that such scientists would fail to understand this expectation since all their theorizing is symptomatic of a severe case of existential depravity. And yet they describe the *anthropic principle* as

“the idea that we can draw conclusions about the apparent laws of physics based on the fact that we exist.”

Lastly, to reinforce our point we've been trying to emphasize in the last three paragraphs, such scientists have no problem calling their publications, inventions, new technological breakthroughs and other such products human creations. Yet when they look at the vast cosmos before them and the infinitely immense subatomic world they detect and predict through their mathematical models and experiments, they have no compunction in depriving such entities of a designer, a maker, a creator.

What if we were to flip the *anthropic principle* on its head? What if we were to provide a different rendition for this important concept in modern physics? For it is not counterintuitive to carry out such an experiment. Indeed, we are just doing that, an activity which itself begs the question regarding how we can do it in the first place. Truly, most ordinary men and women would find such a flip of the principle quite intuitive simply because it reflects a richer way in which it manifests itself in their daily existence.

Based upon Hawking's and Mlodinow's model-dependent realism and their *anthropic principle*, products of *procedural rationality*, it would be self-delusional to think that we can do it without any solid evidence to justify it. It would be tantamount to raising the perennial conundrum of, 'What came first the chicken or the egg?' A scientist driven in his

or her work by the kind of subjectivism, close-ended premises associated with a model-dependent realism would be left pondering this conundrum forever. However, scientists driven by an existentialist, open-ended perspective would have no trouble stepping out of their procedural contrivance, one might say 'the egg', and pose a question about the very existence of the egg and how it came to be and about why and how it came to assume the form that it does.

A selfie taken by an individual espousing the present version of the *anthropic principle* would see what? He or she would see a biological unit whose apparent existence can be accounted by cosmic laws which seemingly are of such a nature as to permit cosmic and subatomic dynamics which in turn result in the creation of conditions designed to facilitate the eventual emergence of life and human life as we know it.

On the other hand, a flipping of the *anthropic principle* on its head would result in a selfie of an intelligent being, still working within the parameters of existing laws/principles of existence, engaged in a visioning process aimed at creating conditions in space and time which through their dynamic interplay would eventually lead to the emergence of human life as we presently know it and experience it. Such a being could even be one of us or some other intelligent entity entrusted with such a grand project. If the latter were the case, then his or her existence would also require justification. The important point here is that intelligence precedes creation, a view that is more consonant with our experience

of ourselves as human beings than with a close-ended view provided via the model-dependent realism and *anthropic principle* of Hawking and Mlodinow. This view may not comply with the requirements of these two individuals' scientific paradigm, but it certainly complies with a more holistic view of human rationality/intelligence, with a more inclusive human anthropology.

Final thoughts

The mathematical models of physics, such as the model-dependent realism of Hawking and Mlodinow, are outcroppings of what Herbert Simon calls *procedural rationality*, itself a child of *functional rationality* conceived to augment its own problem-solving capacity. Herbert Simon tells us that *procedural rationality* is a manifestation of *bounded rationality* (limited/subjective). As such the best that *procedural rationality* can hope for in its problem-solving is the identification of "good solutions". As I write elsewhere in applying these notions from the social sciences to a discussion of the claims of quantum physics, *procedural rationality* kicks in at the point when *functionality rationality* becomes aware of its own limitations. At that point, it shifts modes and starts creating intellectual or physical (technological) contrivances by which to assist it in its problem-solving tasks. Within this context we can safely say that mathematics itself can be viewed as one such product of *procedural rationality*.

We have reached a point at which rationality is becoming aware that even its procedural offsprings are not themselves good enough to enable us to more fully know and appreciate the multi-dimensional nature of reality in which notions like infinity, matter, energy, time, space are not mere theoretical and mathematical variables. These constructs possess existential status whose wholeness and richness we can ever hardly come to know let alone value and appreciate with the present tool kit provided via *procedural rationality*, which has come to consider itself, quite normal for a creature of subjectivity, an end in-itself, and the multiverse it has conjured up as part of a close-ended cosmic system.

Another way of looking at the predicament is to see *procedural rationality* with its model-dependent realism and *anthropic principle* as refusing to acknowledge its substantial origins, the different manifestations of rationality, and human intelligence's potential for transcendence. As a result, *procedural rationality* is in denial of its own limitations and thus of the unexplored potential of the *anthropic principle* which without such constraints could admit that the same cosmic laws and conditions have indeed caused the emergence of human life that shows all the signs of an intelligent design and designer as its ultimate justification-- a view in which the image of the designer is mirrored in the designed.

Consequently, in view of such restraints built into the model-dependent realism and *anthropic principle* proposed by Hawking and Mlodinow, we must look elsewhere for a solution to the predicament. In other words, human rationality must seek out, design and construct a new intellectual contrivance by which to obtain a more holistic and complete picture of itself and thus of reality.

What we need is a *super anthropic principle*, one that transcends both the weak and strong versions and in the process, affirms a more holistic human anthropology. We need an *anthropic principle* which reflects the fact that human beings have surpassed themselves countless times over during their evolution and have reached a point in their cosmic timeline where and when they can distance themselves from the process, reflect, intuit, reason, and proclaim that they have become more than the sum total of what the laws of the universe and the conditions of the multiverse have facilitated. Human beings' present phase of development calls for an *anthropic principle* which frees them from the laws and conditions which brought them thus far and which affirms that hereafter they will become equal partners (designer/ creator) in fashioning their future evolution

We need an *anthropic principle* which human beings would have no reservations of flipping on its head based on their realization that they are the by-product of an intelligent design, that an intelligent design and designer pervade everything that exists.

A simple version of the *super anthropic principle* could be stated thusly: Human beings exist in the form that they do because the laws of the multiverse which they inhabit and the conditions which these laws spawned were just right for the emergence life. Moreover, just as human beings through their powers of rationality have identified principles and rules by which to nurture environmental and cultural conditions leading to the emergence of civil societies throughout world, an intelligent being, existing beyond space and time, conceived the idea of a multiverse, designed it, created it with laws, which, in turn, formed and nurtured conditions which led to the emergence of human

existence, and all other intelligent beings that remain to be encountered along the way in our human trek in space and time.

In the end, what is most amazing is that as a rational being I can postulate such a grand conception about the nature of human existence and cosmic reality. Such an act gives witness to human beings' insatiable appetite to wonder, to ask questions, to intuit/discern, to know, to problem solve. At every step, human intelligence can transcend itself, go beyond its conceptual constructs and material extensions of itself in an incessant process to know more about itself and external reality. It is an open-ended process with no obvious boundaries. Viewed thusly human existence is open to the infinite, not just to a mathematical version of it, but to an existential infinite.

In one last point, I want to underscore the importance of attributing an existential status to such notions as *infinity* in mathematical physics. For once existence is infused into *infinity*, then the 'sky is the limit' for mathematical and scientific theorizing. The attribution of existential status to *infinity* will require and cause a critical shift on our intellectual perspective of ourselves and the multiverse which we inhabit and on our problem-solving activities. And it will cause a fundamental shift on the context in which we exist. A context with no boundaries, one that is existentially infinite, will force us to raise a new set of questions and engage us on a completely different type of journey and conversation, both personally and scientifically, a trek without a 'final frontier' and a story without end.

Notes

¹Stephen Hawking and Leonard Mlodinow, *The Grand Design*, New York: Bantam Books Trade Paperbacks ed, 2012, p. 43.

²The word “divine” is another name for a priest found used especially in the Anglican tradition.

³Eric Mascall, *Christian Theology and Natural Science. Some Questions and Their Relations*, London: Longmans, 1956.

⁴Stephen Hawking and Leonard Mlodinow, *op cit*, p. 7.

⁵Eric Mascall, *op cit*, p. 89.