**Space: You just have to be there!**

**Flatland, Scientific Realism, and Describing the Noumenal**

[**INTRODUCTORY NOTE** – Prior to writing this paper, I finished reading Hud Hudson’s book, *The Metaphysics of Hyperspace*. It was my second attempt. The first time I tried to read it, I realized within a few pages that the book was over my head. Since my previous knowledge of the philosophy of space and time only went up to Kant, I resolved to try it again when I had read some contemporary philosophy of space and time as a prelude to reading both Hudson’s book and Ernest Cassirer’s *Substance and Function* (which I have also since completed.) So, beginning with Hans Reichenbach, I worked my way through the various books in my library dealing with the philosophy of space and time. Even with this background, I found a good bit of Hudson’s presentation over my head and almost quit reading his book a couple of times. However, I persevered and my virtue was rewarded, in the end, with a crepuscular understanding of what hyperspace is and some of its intriguing implications for metaphysics and the Philosophy of Religion.

 As I understand Hudson, what he calls hyperspace is a fourth spatial dimension in addition to the three Euclidean dimensions revealed to us by our everyday perceptual experience.[[1]](#footnote-1) This dimension is real and exists as part of the physical world despite our inability to perceptually apprehend it. In his book, Hudson notes that positing hyperspace suggests a novel perspective on and potential solutions to a number of knotty philosophical problems both in metaphysics and the philosophy of religion. In the spirit of exploration evinced by Hudson’s book, in this paper I will develop some speculations informed by the possibility of hyperspace understood as I stated it above.

 Hudson and I share some philosophical predilections in common (e.g. theism and an interest in the idea of hyperspace) but differ signally in other, perhaps more important ways. He is a materialist and I am a dualist. I endorse Presentism, the reality of temporal passage, the openness of the future, and (by default) three-dimensionalism, whereas Hudson is an Eternalist and Four-Dimensionalist presumably committed to a block universe with a closed future. Given these differences, it is hardly likely that we would altogether agree on how to develop or apply the notion of hyperspace to metaphysics or the human cognitive situation.[[2]](#footnote-2) That does not prevent me, at any rate, for seeing value in the notion of hyperspace even if interpreting somewhat differently from Hudson, whom I wish to thank for making available to me a whole new perspective on these matters. But, as Aristotle would say, enough of this. Let us now proceed to the paper itself.]

In his short but fascinating book *The Metaphysics of Hyperspace*, Hud Hudson discusses the possibility that there might be a fourth spatial dimension in addition to the three recognized by common sense on the basis of lived experience, along with the notion that we ourselves might be spatially four-dimensional rather than spatially three-dimensional beings.[[3]](#footnote-3) Although Kant made some brief comments about the possibility of further spatial dimensions, the first real suggestion that there might by a further, hyperspace dimension to physical space was scouted in E. A. Abbott’s *Flatland*, a novella published in 1884.[[4]](#footnote-4) Subtitled “A Romance of Many Dimensions,” Abbot’s book describes a world of two-dimensional beings and tells the story of one of them, A. Square, recounting his struggles and adventures as he attempts to come to grips with the notion of spatial dimension and, in particular, the “third dimension” revealed to him by Spherius, a three-dimensional being who enters his world bringing interdimensional revelations of the higher truth about space.

Abbott was a clergyman, a priest of the Church of England, and this perhaps helps explain why he wrote this odd little book. Whether intentionally or merely as a subtext, one of the leading themes of the book, explored from a number of different angles, is the difficulty of understanding, describing, and talking coherently about the noumenal, understood as that which is posited as real but as existing in such a way as to be in principle beyond the possibility of being apprehended as part of the stream of lived experience *via* sense perception. In a very oblique way, I think, the main topic of *Flatland* is really the problem of talk about God, a noumenal object the nature and propriety of talk about which has been much discussed, but which in the end is only one noumenal object among others that, for various reasons, scientists and philosophers have thought it legitimate or necessary to posit as part of explanatory theories, and about which similar difficulties can be raised. These question include such concerns as how we can fix the reference of the terms intended to refer to such things or justify their applicability to those putative entities, and above all, how such terms can acquire substantive as opposed to merely formal (“place-holder”) meaning for us in scientific theories. One might say that the basic question raised by *Flatland* is the comprehension and description of noumenal reality and, in particular, noumenal realities that one cannot apprehend either by using the senses or by the use of visual imagination in relation to abstract mathematical constructs. This is a profoundly interesting question and one that I will return to anon, after discussion of a variation on the *Flatland* scenario.

Of course, Kant, Logical Positivists, and some contemporary empiricists such as Bas Van Fraassen insist, for various reasons, that nothing substantive can be known about such entities, and that it is for the most part useless to posit them or investigate their natures. Others are not so pessimistic, and I am one of these. However, I will not make any proposal in this essay about how substantive knowledge of noumenal entities, however crepuscular, is to be acquired, reserving this project for another time. Instead, I simply want to motivate the problem and will use Abbot’s *Flatland* to do so, by engaging in a parallel discussion of the general idea of spatial dimension, the primary thread of which will be the cognitive difficulty of conceiving of “higher” spatial dimensions than those available in to us in ordinary lived experience.

 **Return to Flatland**

 First, a little bit of the story told in *Flatland*. The protagonist, A. Square, who perceives himself as a two dimensional being (a plane figure) living in a two-dimensional world (a geometrical plane), is at home one day when suddenly, in the middle of the “floor,” he perceives a point that expands into a circle and then shrinks back to a point before reappearing as the circle once again. This is Spherius, a three-dimensional being intersecting the plane in which A. Square lives and who brings glad tidings of a third dimension existing beyond the two spatial dimensions revealed in the lived experience of A. Square and the other inhabitants of Flatland. Persuaded that Spherius is real and can be trusted, A. Square becomes converted to what we might call “thirdism,” the view that the real or noumenal world contains a third spatial dimension that does not enter into the lived experience of Flatlanders. He accepts and pledges secret allegiance to this doctrine on the basis the interdimensional revelation made by Spherius even though it is completely contrary to Flatland common sense, Flatland science and, in addition, is proscribed by the law of the land, which decrees that Thirdism may neither be professed nor propagated among the people on pain of imprisonment or death.

In the course of the story, A. Square is progressively introduced to various realms, Pointland (with zero dimensions), Lineland (with one dimension), and Spaceland (with three dimensions) with which to compare his own realm (Flatland, with two dimensions). He tries but fails to explain what Flatland is like to the kings of Pointland and Lineland and, having no access to Spaceland as part of his own lived experience, is unable to make the idea of a third dimension of space intelligible either to himself or to his intellectual superiors among his own kind, despite being given hints and analogies by Spherius. In each case, the difficulty arises from his inability to make his case in terms that his auditors are capable of imaginatively conceiving and thus understanding in terms of their particular mode of lived experience. The dimension that each occupies and the limitations this places on their perceptual experience of space as each encounters it in lived experience (and thus on their power of visual imagination) proves a constant stumbling block to the understanding dimensions “higher” than their own.

 Abbott takes it for granted that the realms he discusses are in fact separate ones each of which is limited to a fixed set of dimensions and no more. Each is thus accurately apprehended by its denizens. However, suppose that this is not the case, and that each dimensional realm is really embedded in a single, multidimensional space corresponding to the number of dimensions that actually exist. The only difference between a point-being, a line-being, a ribbon being, and a space-land being will consist in the manner in which each apprehends itself. Thus, while a point being will apprehend itself as a single point, it is in fact a multidimensional being, or part of such a being without being able to apprehend that fact. In the same way, a being that apprehends itself as a line may also be multidimensional but have no perceptual/imaginative access to that fact, able only to apprehend one of its angular edges or that of some larger complex to which it belongs. In the case of the denizens of Flatland, let’s suppose that instead of being two-dimensional plane figures, that these beings are actually three-dimensional tiles of a uniform height taking various geometrical shapes: triangles, squares, pentagons, etc.[[5]](#footnote-5) Denizens of Flatland, however, are capable of apprehending only the perimeter of their top or surface layer, which has only the thickness of a single point, and those of other Flatlanders whose surface layers lie in the same plane.[[6]](#footnote-6)

Flatlanders, then, perceive themselves as plane figures and all agree that this is the case for all members of their kind. As far as they are concerned, this is an obvious fact, so that the consensus of Flatland common sense is that each Flatlander is either a line or a plane figure of one or another sort, which sort is determined by the number of sides extending from triangle (with three sides) up to circle (with infinite sides). Nor is Flatland common sense altogether wrong; each Flatlander is, in fact, the plane figure that its top, surface layer instantiates so this claim is true in each case so far as it goes. However, Flatland common sense goes wrong in supposing that the Flatlanders are nothing more than the plane figures each instantiates as the perimeter of their top or surface layer and that to be such figures is their essence or nature in such a way that this exhausts their being. They are more, so much more! At the very least, they are three-dimensional tiles possessing concrete physical realization as beings with solidity, height and mass as well as size, shape, and extension, being made out of matter and possessing what we three-dimensional beings would call a physical micro-constitution. Indeed, this much is “obvious” to us though completely beyond their ken in principle, at least through the exercise of their unaided cognitive powers. An important consequence of this is that Flatlanders are not only woefully ignorant of their own natures, but are capable only of the most limited metaphysically relevant information about themselves. They are thus hardly in a position to dogmatically expound on such matters.

Nevertheless, we may suppose that Flatland scientists, guided by a Flatland common sense and combined with observation and experiment, will have arrived at some conception of the laws of nature that they will regard as universal, exceptionless, and inviolable. These laws will be grounded in the ontology indicated by Flatland common sense and, let us suppose, possess empirical adequacy for Flatland scientific purposes concerning what Hume calls the “ordinary course of nature.” Flatland scientists will claim overwhelming empirical support for these laws, and so regard them as so well-confirmed that no particular empirical claim that would imply their falsity could possibly carry greater evidential weight than those laws themselves and thus would be reasonably dismissed without examination by all sensible Flatlanders…well, at least until Fred’s Miracle came along.

 **Fred’s Miracle**

 Let’s suppose that at one point, it is decided to divide Flatland into two separate, autonomous realms, West Flatland and East Flatland. To enforce the border, Flatlanders take what they apprehend to be two-dimensional building materials and construct a wall the entire length of Flatland (let’s suppose that Flatland is a bounded plane) to divide East and West. Along the wall, there is only a single gate, Checkpoint Charlie, which is guarded on both sides and normally locked except on those rare occasions when someone from the West needs to travel to the East or vice versa. There is no other way to travel from East to West or West to East in Flatland except *via* Checkpoint Charlie. As such, it is normally impossible for any Flatlander on either side of the wall to travel from one side to the other.

However, let’s suppose that there’s a pesky, spatially three-dimensional being who wishes to spread mischief among the Flatlanders. This being picks up a Flatlander named Fred and moves Fred from the East, where he was previously located, to the West and places him at some arbitrary location. Flatlanders who were with Fred at the time of his translation report that he simply disappeared without a trace; Flatlanders who were there when Fred suddenly found himself in the West report that he simply materialized out of thin air.

 It’s a miracle! Fred apparently moved in such a manner that he was first in one place and then another without covering the intervening space in between these two, vastly separated places. More than this, he somehow went from East Flatland to West Flatland without going through Checkpoint Charlie. Asked about it himself, Fred tells investigators that he suddenly had the experience of moving in a new, upward direction, and of possessing previously unapprehended properties of height, solidity, and weight. As he rose, Fred says he could see Flatland from above and that it looked very different from that external perspective than it does when one is living in Flatland. When asked how he got through the wall, Fred replies that he could also see the wall from his elevated perspective and that he crossed it, not by going through it, but instead by going over it.[[7]](#footnote-7)

Of course, the investigators are incredulous. What is “an upward direction?” What could Fred possibly mean by “height, weight, and solidity?” What sort of perspective is “looking down from above?” How can anyone “go over” anything, let alone an impenetrable wall? Fred himself admits that he has no way of explaining any of this in terms that would be intuitively acceptable to the investigators in terms either of Flatland common sense or Flatland science. “You just had to be there,” he says, while admitting that having returned to the familiar confines of Flatland’s lived perspective on experience the whole episode has taken on a dreamlike quality and become fuzzy in the details, so that even he can’t quite remember what “upward” and so on really mean.

At the same time, the editors of the Flatland equivalent of the *Skeptical Inquirer* set about to debunk Fred’s miracle, which of course they antecedently “know” to be impossible. After a thorough investigation, unable to find to any plausible “naturalistic” explanation for the occurrence of Fred’s miracle in terms of flatland common sense (such as an alternate way through the wall) they fall back on the old standbys of “mass delusion” and “clever hoax engineered by a powerful conspiracy for self-interested ends.” As their trump card, they make the appeal to Flatland science and its laws of nature: whether or not we can contrive an alternate explanation for the events reported, we know that this event could not have happened because it is contrary to the laws of nature. So there!

Our three-dimensional joker has had his fun imposing on the pompous, overconfident flatland scientists and philosophers who deny that Fred’s miracle is possible. Nevertheless, no matter how comical and objectionable their dogmatism may appear to a properly placed outsider, they need not be in any way doxastically culpable for accepting the substantive beliefs that they do given their circumstances. For, given the limits of the Flatlanders’ powers of spatial apprehension and visual imagination and their conception of the laws of nature that they have no reason to doubt and no way to discover to be false, they can have no reason to suppose that their theories, in which they take such pride as the product of reason and theoretical inquiry, are anything but empirically well-confirmed and thus credible according to the standard canons of theoretical inquiry. Indeed, at least in accordance with some currently popular options on offer in epistemology and the philosophy of science, we have every reason to suppose they would be epistemically justified in so doing, despite these beliefs being entirely false if understood literally and not even approximately true to any significant degree. That is because the beliefs that they have arrived at are the very best that the Flatlanders, given their limited cognitive abilities and unfortunate cognitive situation, are capable of entertaining or arriving at on the basis of the evidence available to them..

For example, proponents of Flatland virtue epistemology would claim (with the same plausibility that we might concerning our own natural science) that given the fact that Flatland science is the product of the most careful, sophisticated, and selfless employment of reason possible for Flatlanders and represents the universally accepted fruits of objective theoretical inquiry, that it is both reasonable and rational (in a performative sense) to endorse and accept that science as objectively true. In this sense, one is “within one’s rights” to do so and so inculpable for so doing. After all, they may say, the methods we use to form scientific beliefs are the best ones available to us – those most likely to lead us to the truth if attainment of the truth is at all possible for us. Proponents of Flatland scientism may well argue, in addition, that other methods of forming beliefs about reality are not as reliable or are in some way problematic so that those who form their beliefs in accordance with them are thereby convicted of (performative) irrationality – not doing the best that is available to them, and thus may be held guilty of believing in abeyance of their doxastic obligations. Such will be the case for Thirdists, who base their allegiance to the doctrine of three spatial dimensions on the revelation of Spherius and the account of Fred’s miracle. Given that evidence, they don’t have much of leg to stand on, and therefore, if they are rational, ought not to continue to affirm Thirdism.

Again, like many contemporary defenders of scientific realism, proponents of Flatland science may appeal to inference to the best explanation to justify acceptance of Flatland common sense and the science they have arrived at through theoretical inquiry. From the perspective of Flatland science, the reigning theories (we may imagine) are both well-confirmed and meet the standard criteria for a successful explanatory theory accepted by most or all mainstream researchers, whether they live in Flatland or Spaceland. These theories work and are predictively successful. More than this, Flatland science betrays no limitations in its application to phenomena, performs well in the face of novelty evidence and what anomalies plague it are well within rationally acceptable limits, so that it does not appear to require any supplementation from beyond itself that would positively justify the positing of any additional realities other than those “quantified over” by Flatland science as it stands. More than this, there are a number of well-known and widely accepted practices internal to theoretical inquiry (methodological naturalism, sophisticated versions of verificationism, the Stratonician and Negative Evidence Principles, peer review, etc.) that militate against, nay, in a performative sense *rationally forbid* that we posit any entities beyond those needed for Flatland science to do its work. Anyone who does so, then, stands convicted of a form of culpable subjective irrationality.

Of course, this is precisely what Thirdism proposes that Flatlanders do by positing the existence of a third dimension of space in no way apprehensible by Flatlanders given the way their Kantian form of outer sense limits their apprehension of space. Since Flatlanders have no access to this supposed third dimension *via* their own lived experience, it can only be a theoretical entity for them, one for which they can have no reason in principle from within lived experience to posit – this “third dimension,” whatever it is, can only be utterly transcendent and noumenal in relation to them. The only evidence for Thirdism that its proponents can muster is A. Square’s testimony concerning the revelations of Spherius (which we may suppose have been written down and clandestinely circulated by Thirdists, who treat it as a kind of scripture) and the tale of Fred’s miracle. However, according to their Athirdist opponents, even if we give these evidences their full weight, they fall far short of anything that could justify Thirdist claims.

According to the Athirdists, extraordinary claims, like those concerning the supposed “third dimension,” require more than ordinary proof if they are to be reasonably believed, and revelation and miracle reports are not adequate to provide that proof. Testimony, they say, is notoriously fallible and there are many alternate possible explanations capable of accounting for such reports, even if those who utter them appear to be sane and otherwise credible witnesses speaking with genuine conviction. Athirdists assert that some claims, such as that there is a third dimension and that all Flatlanders are actually three-dimensional beings, are simply so incredible on their face that it is always more reasonable to reject them out of hand than to accept them on the basis of testimony, even in the face of seemingly incontrovertible evidence for the sanity and sincerity of those who promote them on the basis of that testimony. In the extremity, Athirdist can always plead that the apparent sanity and sincerity of those who report such claims is only apparent and, like Hume, “believe the lesser miracle” that A. Square (who, we may suppose. refuses to recant his claims even under threat of torture or execution) was mad or bad rather than what he said was even so much as remotely likely to be true.

Of course, from our privileged, God-like perspective relative to that of the Flatlanders, we know different. The third dimension really does exist and the Flatlanders really are three-dimensional beings. Spherius exists and really did appear to and reveal these facts to A. Square. Fred’s miracle really did happen. Flatland common sense and Flatland science, which say otherwise, are wrong. Those who base their Athirdism on the foregoing sorts of arguments, though apparently epistemically justified, are nevertheless led by reason, common sense, and science into false, self-stultifying beliefs, and any metaphysics and ontology based on those false beliefs will simply ramify that error and its falsity throughout their noetic structures, infecting every department of theoretical inquiry and perhaps even corrupting their practical reason as well. This is not because there is anything wrong with reason, common sense, or the scientific method considered in themselves. Instead, it is a consequence of the unfortunate limitations of Flatland cognitive faculties in relation to the apprehension of noumenal space. Ironically, it is only those Flatlanders who, in a Jamesian mood, are willing to make the “leap of faith” and affirm Thirdism who have any chance of getting at the truth of things and seeing the world aright, though as we shall see, that vision even in the best circumstances remains partial, incomplete, and crepuscular in a manner that makes it an inadequate foundation for metaphysics or ontology.

More than this, it is evident to us, spatially three-dimensional beings that the appeal to the laws of nature offered by the editors of the Flatland equivalent of the *Skeptical Inquirer* on behalf of Flatland common sense and Flatland science is completely unsound and at best the product their inculpable ignorance of the actual truth about the nature of things. The principles Flatlanders are led to affirm by Flatland common sense and Flatland science as “the laws of nature” are not, in fact, the true laws of nature after all. Admittedly, they are the principles that would have been the laws of nature had the physical universe been a two-dimensional world in the manner that Flatlanders apprehend it, so that there is a certain inevitability in their arriving at precisely the sort of science they have in fact arrived at given the nature of reason and the canons of theoretical inquiry taken in the context of the cognitive limitations that afflict the Flatlanders. Still, both we and the three-dimensional troublemaker who caused “Fred’s miracle” knows at a glance that the account of things presented in Flatland science is simply false, and that therefore the “laws of nature” in which Flatland scientists place such confidence, are in fact literally false concerning the realities they describe and even on the most generous interpretation far from being even “approximately” true as most scientists and philosophers use that (largely vacuous) term.

The laws of nature as understood by Flatland science may exclude the possibility of Fred’s miracle, but the laws of nature operating in the more inclusive realm of three-dimensional space do not and, since we know that Flatlanders are not, after all, two dimensional those laws, which do permit Fred’s miracle, trump those held by Flatland scientists. This holds without regard to the amount of empirical evidence that these Flatlanders can muster for them, since that evidence is neither relevant nor dispositive with regard to what is physically possible in a general sense in the multi-dimensional physical universe exiting in the actual world. Modesty, then, not overbearing smugness, is the proper attitude that Flatland scientists should evince. Their ignorance, if it were exposed to them, would be profoundly embarrassing to them in proportion to their dogmatic confidence in the truth of Flatland common sense and the traditional Flatland science based on it. If that ignorance were to be revealed to them, their embarrassment ought to be compounded with shame as well. More than this, Flatland philosophers who base their metaphysics and ontology on Flatland science will simply be deluded if they think that, in doing so, they are comprehending reality or being as it is in itself.

 **Flatland Scientific Revolution**

Now suppose that it was revealed to Flatlanders by an authoritative source (say, the second coming of Spherius or some other third dimensional intruder that simply leaves no reasonable doubt about the matter) that, despite their severely limited ability to apprehend their real status as three dimensional beings, in truth they are genuinely three dimensional beings composed of a densely ordered stack of layers existing simultaneously in a densely ordered stack of such planes, of which they are capable of apprehending only the top or surface layer and the plane containing that layer. “Nonsense!” say the Flatlanders, at least at first – such an idea flies in the fact of common sense, and is plainly unintelligible – what could a “stack” of planes be or consist in? However, suppose that at least some of them, like A. Square and the other Thirdists, are willing to put aside dogmatic Flatland common sense and the science based on it and entertain the idea that they are more than merely plane figures. How would they go about wrapping their minds around the idea that they are three-dimensional in such a way that their two-dimensional attributes are merely properties, aspects or functions of their fuller reality?

 Perhaps they could develop a new paradigm in natural science, replacing (say) two-dimensional Flatland science with a new mathematical physics. Thus, the Flatland equivalent of an Einstein might propose that time, which Flatlanders also experience, could be combined with the two spatial dimensions in order to create a mathematical model of 2+1 dimensions and in this way arrive at 2+1 relativity theory. The purpose of so doing would be to arrive at a model that would allow Flatlanders to mathematically represent three-dimensional existence to themselves by treating time as though it were another spatial coordinate in a mathematical construct called “3D space-time” integrated into an overall mathematical model of reality. Further, let us suppose that the version of relativity theory they develop is, in fact, structurally isomorphic to three-dimensional space in such a way as to permit experimental testing and confirmation, make successful predictions, the derivation of mathematical laws of nature, and so on, within the inevitable limits of Flatland lived experience. Flatland physicists thus feel confident that they have comprehended the third dimension in this way even without apprehending it and thus have arrived at a substantive conception of the noumenal realities referred to in their physical theory, which now admits the existence of a transcendent third dimension posited as one of the theoretical entities “quantified over” by that theory.

At this point, Flatland physicists and philosophers might suppose that this knowledge is clear, distinct, and complete enough to provide a basis for metaphysics and ontology. In working out the implications of this project, they arrive at a conception of themselves as 2+1 space-time ribbons (since the have only one side) embedded in a frozen plane which excludes all temporal passage so that there is no distinction, as there is in lived experience even for Flatlanders, between past, present, and future. In that case, the physical world as envisaged by Flatland scientists and intellectuals will be without time, change, or motion as these terms are ordinarily understood and experienced by everyday Flatlanders. Those ordinary Flatlanders who demur at this account of the nature of things are told by Flatlanders “in the know” that they are simply not competent to judge in these matters or to challenge the teachings of science, to which it is their part to humbly accede.

In the same way, Flatland physicists will have arrived at some conception of the mathematical laws of nature that they will regard as universal, exceptionless, and inviolable.[[8]](#footnote-8) These laws will be grounded in 2+1 relativity physics and, let us suppose, possess empirical adequacy for all Flatland scientific purposes. Flatland scientists will thus be able to claim overwhelming empirical support for these laws. If they are scientific realists, they will be inclined to use the arguments previously employed in favor the old Flatland scientific paradigm in support of the new paradigm, which we shall suppose still retains enough elements of the older paradigm it supersedes that one can claim significant continuity between the two paradigms and thus assert that the new paradigm retains and preserves whatever was genuinely true and strongly affirmed to be such in the older paradigm, and to suggest this as a mark of its truth.[[9]](#footnote-9) We may have missed the mark last time, say Flatland physicists, but this time we are on the money – for sure!

More Flatlander *hubris*, of course, but once again objectionable only on account of their overweening confidence. After all, given the limits of the Flatlanders’ powers of apprehension and visual imagination, they can have no reason to suppose that their theories, including the 2+1 relativity physics in which they take such pride and place such stock, are anything but empirically well-confirmed. Indeed, we have every reason to suppose they would be epistemically justified (at least in accordance with currently popular options on offer in epistemology and the philosophy of science we considered earlier) despite being entirely false if understood literally and not even approximately true despite being the very best that the Flatlanders, with their limited cognitive powers, are capable of entertaining or arriving at as a result of theoretical inquiry.

Nevertheless, from our privileged perspective we know that this none of this is true about the noumenal world. There is no such thing as 2+1 space-time, Flatlanders are not space-time “ribbons,” and no matter how empirically adequate 2+1 relativity physics may be for both quotidian and scientific purposes in Flatland, those facts make no odds at all where the question of the literal truth of the claims of Flatland physics, construed realistically, are concerned. Despite being the very best that the Flatlanders, with their limited cognitive powers, are capable of entertaining or arriving at as a result of theoretical inquiry, it remains that their physics is entirely false if understood literally and nor even “approximately” true to any significant degree. The best we can say for it is that it is not false or inadequate in a way that its falsity is capable of being discovered or detected by Flatlanders themselves, and so must be true at least to that extent, but as we can easily judge from our superior perspective that extent falls far short of anything even remotely adequate to the description of the realities they intend to model.

Returning to our main topic, we may conclude that one of the lessons of *Flatland* is that, when it comes to spatial dimensions, “you just have to be there;” space can only be apprehended, not comprehended as it really is by any sort of abstract, mathematical theory by means of which a being apprehensively limited to a particular spatial dimension could try to model it. Knowledge of the existence and nature of space can only be acquired in a top down manner: if I can apprehend the third dimension in lived experience, then through precisive abstraction I can think away the “higher” dimension and imaginatively constitute space as two, one, or zero dimensional and examine each of them as such *in mente*. However, nothing will allow me to advance in imagination from any “lower” dimension to any of those that are “higher” in relation to it – lower dimensions cannot be usefully combined with higher ones in order to “generate” an intuition of yet higher spatial dimensions. Dimensions of space higher than those available to me through reflection on lived experience remain literally unimaginable to me and, to the extent that the understanding of the dimensionality of space depends on apprehending it in lived experience as the Kantian “form of outer sense,” any spatial dimension that transcends lived experience must lie in principle beyond the ken of any being excluded from experiencing the phenomenal world from that perspective.

Therefore, despite the fact that Flatland 2+1 relativity physics is the result of rational, theoretical inquiry, is well-confirmed in accordance with the standards of rationality applicable to two-dimensional beings, “works” for them, and is such that it tends to create consensus among all sincere Flatlander inquirers, *it is not true. It is not even approximately true to the real facts of the matter.* At best it is partial, fragmentary, incomplete, and incapable of being corrected or completed from within the two-dimensional perspective to which each Flatlander is ineluctably confined. In that case, while giving due credit to their efforts, the best we can say for them from the point of view of a three-dimensional being is that their theories about space are not entirely false and “as good as true” for them without being even approximately true to the realities about which the Flatlanders endeavor to think and speak, realities of which we are directly aware from the perspective of lived experience.

Indeed, if the existence of a “third dimension” could be even so much as entertained by Flatlanders, it could come to them only as a revelation, just in the manner that, in *Flatland*, Spherius appears to A. Square and proclaims the evangel of this additional dimension of space, necessarily unimaginable for one whose apprehension of space is limited in principle to two dimensions. In such case, it would not be surprising that, as the story may well go, despite Fred’s miracle most Flatlanders remain pronounced “Athirdists” more than ready to use the power of the state to persecute and even imprison those Flatlanders who accept the Gospel of Spherius and, indeed, are more likely to do so the more highly educated they happen to be. Even among the believers who accept the testimony of A. Square and the authenticity of Fred’s miracle, it remains that their attempts to model this “third dimension” mathematically in their 2+1 relativity physics, even though the best they could do in any case given their cognitive limitations, will fall far from representing the truth of the matter with regard to the nature of three-dimensional space. Despite this, from our superior point of view we will still have to judge the Thirdists closer to the truth than the Athirdists who reject the third dimension out of hand. For what it’s worth, the Thirdists are right and the Athirdists are wrong. How important it is to be right about this, of course, will depend on what’s at stake, and in this case, we might suppose that it doesn’t amount to much to be right about this. However, this may not be true about all imaginable analogous situations – it may be the case that a great deal is at stake in at least some of them so that it is signally important to be right about the matters they concern. However, I will not stop to consider such situations here.

 **Application of these Reflections to Our Own Case**

In a cartoon version of *Flatland*, A. Square suggests to Spherius that, just as there is a third dimension of space that has been revealed to Flatlanders, that lies entirely beyond their apprehension, and of which they can have only the most crepuscular comprehension by means of their mathematical physics, perhaps there is a fourth, additional dimension of space (called “extra-height”) beyond the three spatial dimensions available to Spherius and his three-dimensional fellow beings in their lived experience. Spherius scornfully rejects this suggestion, just as the Flatland intellectuals reject “thirdism.” The very idea, he exclaims, is impossible, unintelligible, outlandish, and absurd. No dimensions beyond three dimensions are even so much as conceivable, except perhaps as an idling mathematical construct. As the outraged Spherius flees away in a huff, leaving Flatland behind for the final time, in the distance the scene fades and the camera angle shifts away from Flatland onto a new horizon, where a four-dimensional tesseract can be seen coming into view.

The moral of this story is not far to be seen. Although our three-dimensional funster may feeling pretty smug right about now and pleased about all the mischief he has been able to cause in Flatland, not much reflection would be needed to bring him to the realization that his own plight might be analogous to those on whom he has practiced to impose. Suppose, for example, that instead of being three-dimensional beings living in three-dimensional space, we are actually four-dimensional beings living in hyperspace, which contains our three-dimensional space in the same way that our three-dimensional space contains the two dimensional space of Flatland. In that case, although I apprehend myself as a three-dimensional being, I am really something quite different, and indeed unimaginably different, from the way I apprehend myself in lived experience. Further, given my current cognitive limitations and circumstances, I have little if any prospect of remedying this curious form of self-estrangement. At the same time, like the Flatlanders, I cannot rest entirely content with my common-sense beliefs, since these, though perhaps correct as far as they go, are insufficient for the kind of self-knowledge and knowledge of nature that philosophers and scientists seek.

In apprehending myself as a spatially three-dimensional being, my common-sense knowledge of myself is a lot more detailed than that available to the Flatlanders. In the same way, if I attempt to approximate what it is to be a spatially four-dimensional by using relativity theory and having recourse to a 3+1 space-time model for “four dimensional” space I may well acquire a richer mathematical model for characterizing at least some important aspects of noumenal space. Then, using General Relativity and Quantum Theory I may be able to arrive at an impressive system of laws of nature for which I have strong empirical confirmation, conforms well to the canons of scientific explanation, proves to be empirically adequate, produces consensus among competent and serious inquirers, and so on. Nevertheless, it does not follow that I have a right to possess a good deal more confidence in the edifice of our modern science than is appropriate for the Flatlanders to have in theirs. After all, if the foregoing is correct, only a spatially four-dimensional being that apprehended itself as such would be able to know, from his or her own lived experience, what hyperspace is like and what it is like to be a spatially four-dimensional being. So if we are spatially four-dimensional beings, we can only apprehend ourselves as three-dimensional beings and there is no corrective for this. As such, we are in no position to judge how closely our theoretical constructs are adequate to the noumenal realities they are intended to help us comprehend. That judgment lies beyond our powers to make.

It remains, then, that the analogy between the scientific view of the world represented by mathematical physics and the noumenal reality that it attempts to capture in thought rests solely on the structural isomorphism between the relationships and values depicted in its mathematical models and those supposed to obtain between the theoretical entities it posits. It thus remains abstract, partial, and limited in relation to its noumenal object, which it treats abstractly and schematically, and in which the apparent substantive referring terms, in the last analysis, tend to be cashed out as merely the “whatever it is” that the parameters in law-like mathematical statements *ultimately* refer to. In turn, this will be something of which we as yet (and may never) have any clear idea, and such that the ideas we do have are increasingly bizarre and incredible. It behooves us, then, to proceed with diffidence, modesty, and an appropriate degree of caution when applying modern physics in philosophical contexts. For it may well be that, for all we know or could find out, *even* in principle, we have much less knowledge about the noumenal world than we think we do, and thus far less than would justify any metaphysical scheme we might construct on that basis.[[10]](#footnote-10)

1. He does not use it as some science fiction writers (perhaps erroneously) use it to refer to Relativistic “space-time,” nor does he use it to refer to a “space” supposedly enclosed by Riemannian “spherical” space through which “worm holes” can be plotted that will allow instantaneous or at any rate faster-than-light travel from one region of Riemannian “surface” space to another, as in *Star Trek* and other science fiction shows. Further, in his book, Hudson discusses hyperspace, the fourth spatial dimension of material reality, without reference to other recent speculative physical theories that postulate 10, 11, 13 or more “dimensions” to space; I shall do the same, and leave it to others to consider these complications. [↑](#footnote-ref-1)
2. One other important difference between Hudson and myself that requires mentioning here is that Hudson is smart, and not just smart but *really* smart – something that no one would ever accuse me of being. For this reason, I wouldn’t want people to judge the prospects for hyperspace by what I say here – I may have gotten this all wrong. Still less would I want anyone to attribute anything I say here to Hudson or to suggest that he would in any way agree with or endorse any of the speculations presented here. Hudson has spoken for himself and I heartily encourage those interested in either hyperspace in general or in Hudson’s ideas in particular to read what he has written about this topic. [↑](#footnote-ref-2)
3. New York, Oxford University Press, 1995. Hudson gives philosophical arguments for positing hyperspace as a noumenal reality in Chapter 1 of this book. [↑](#footnote-ref-3)
4. New York, Dover Publications, 1952. [↑](#footnote-ref-4)
5. Or rather, since they are multidimensional beings with as many dimensions as there happen to be, we should perhaps better say that they are what a denizen of Spaceland would apprehend them as being and would apprehend themselves as being if translated to Spaceland. [↑](#footnote-ref-5)
6. We are stipulating here that all Flatlanders are of uniform height and thus all occupy the same plane in virtue of this fact. This will greatly simplify matters here. [↑](#footnote-ref-6)
7. Or, alternatively, if Fred is incapable of experience outside of the apprehensible plane of Flatland, he would simply report that he had no memory/experience of what happened in the interval between his disappearance and reappearance – first he was here, then he was there (or is it vice versa?) [↑](#footnote-ref-7)
8. I am assuming that they do not go on to develop a two-dimensional quantum theory, even if they could. [↑](#footnote-ref-8)
9. Stathos Psillos, [↑](#footnote-ref-9)
10. The view scouted here may still be considered a form of scientific realism, however chastened. I believe that a similar view is represented by the “Formalism” of Anjan Chakravartty, *A Metaphysics for Scientific Realism*, Cambridge, Cambridge University Press, 2007. Of course, I make no assumption that Chakravartty would agree with this or be inclined to endorse anything that I have said here. [↑](#footnote-ref-10)