Chapter 3 In the Beginning

1. Did the Universe Have A Beginning?

The question that opens this chapter is likely to strike many people as an absurd one. After all, isn't it obvious all things that exist have to begin to exist and therefore have a beginning?

Well, no, it isn't obvious. Not to everyone. Parmenides (c. 500 BC) said of his ον ("Entity"; "Being")

> Being cannot have a beginning or cease to be; for it cannot be created from Not-Being or reduced to Not-Being; it was never and never will be, but is now, continuous and undivided. . . . It is motionless and unchangeable, everywhere similar to itself [Zeller (1883), pg. 49].

Clearly Parmenides, were he around today, would take issue with the idea that everything that is must begin to be. We use the term "the universe" to mean the complete set of "everything that is" – all the stars, all the planets, all of outer space, and everything everywhere[1]. Therefore, if the universe had a beginning, and because the universe is everything, must it not be true that before the universe began there was absolutely nothing? If so, then where did the "stuff" of the universe come from? Can something arise from nothing-at-all?

In Western civilizations, a religious person is likely to give an answer right away that goes something along the lines of "God *created* the universe in the beginning." Genesis states this quite explicitly. Lao Tzu, without invoking a deity, also wrote that the Tao "formed" (had a beginning):

> Something mysteriously formed,
> Born before heaven and earth. [Legge (1891), pg. 14]

Likewise, Hesiod wrote,

> Verily at the first Chaos came to be [Hesiod (*c*. 700 BC), *Theogony*, 115+].

However, if we take Genesis literally it immediately follows that God existed before the universe came into being. Does this not mean *God* had no beginning? Or does it mean there was some other deity who created God? Christianity, Islam, and Judaism all reject that second idea out of hand and by doing so seem to be forced to admit that at least *something* – namely, God – exists without a beginning. In debates with the Neoplatonist pagans of his day, Augustine of Hippo was challenged to answer questions like, "What was your God doing *before* he created heaven and earth?" However cavalier one might think that question is today, we know Augustine found it troubling because he begged God to explain the meaning of Genesis to him:

> Let me hear and understand the meaning of the words: In the beginning you made heaven and earth. Moses wrote these words. He wrote them and passed on into your presence, leaving this world where you spoke to him. He is no longer here and I cannot see him face to face. But if he were here, I would lay hold of him and in your name I would beg and beseech him to explain those words to me. I would be all ears to catch the sounds that fell from his lips. If he spoke Hebrew his words would strike my ears in vain and none of their meaning would touch my mind. If he spoke in Latin I should know what he said. But how should I know whether what he said was true? If I knew this too, it could not be from him that I got such knowledge. But deep inside me in my intimate thought, Truth, which is neither Hebrew nor Greek nor Latin nor any foreign speech, would speak to me, though not in

[1] If you've read the previous chapter, you should recognize that "the universe" as *a thing* is a defined *set* of things – i.e., it is a noumenon in Slepian's Facet B. You have experience encountering "things in the universe" but not "the universe" *per se*.

> syllables formed by lip and tongue. It would whisper, "He speaks the truth." And at once I should be assured. In all confidence I would say to this man, your servant, "What you tell me is true." [Augustine (c. 397-400), Bk XI. 3, pg. 256]

If the answer to the question wasn't obvious to St. Augustine, why should it be obvious to you or me? Although he was later canonized by the Catholic church, when he wrote *Confessions* he was merely the Bishop of Hippo and certainly not regarded by himself or anyone else as an "authority". To Augustine, *Moses* was the authority and prophet. One might be tempted to raise an eyebrow, then, when we see Augustine asking, in the above quote, how *he* could know *Moses* was speaking the truth in Genesis. It reinforces a point I mentioned in chapter 1 – namely, a person can refuse to accept authoritarianism, whether that of the Bible or any other holy text, without thereby earning the brand of apostasy. What he says about Truth speaking to him is also notable because in effect he is saying he would be *subjectively* certain, not objectively. He would have, he is telling us, a subjectively sufficient reason to believe.

Augustine continued to plead to God for understanding:

> How did you make heaven and earth? Clearly it was not in heaven or on earth that you made them. Nor was it in the air or beneath the sea, because these are parts of the domain of heaven and earth. Nor was it in the universe that you made the universe, because until the universe was made there was no place where it could be made. [*ibid*., 5, pg. 257]

Augustine found himself caught in what a mathematician would call a "regress to infinity" – i.e., every proposition found itself needing a pre-condition; and when that pre-condition was proposed, *it* needed a pre-condition of its own; and *that* pre-condition needed still another and so on without end. Augustine soon realized that even *time* could not be predicated of God nor could it in any way be held to be a pre-condition *of* God:

> Furthermore, although you are before time, it is not in time that you precede it. If this were not so, you would not be before all time. It is in eternity, which is supreme over all time because it is a never-ending present, that you are at once before all past time and after all future time. For what is now the future, once it comes, will become the past, whereas *you are unchanging, your years fail not*. Your years neither go nor come, but our years pass and others come after them . . . Your today is eternity. [*ibid*. Bk XI. 13, pg. 263]

A mathematician today might say Augustine concluded that God's *Existenz* must be in a higher dimensional universe than our four-dimensional universe (three spatial dimensions plus one time dimension). Indeed, Augustine's resolution of the paradox of the timelessness of God vs. mankind's temporal "being" is, remarkably, the same as the conclusion Kant reached 1300 years later – namely, that *time* is a subjective *human* process of *intuition* that God, being superhuman, is not bound to. The "Beginning" of which Genesis speaks is *not* a "beginning" as human beings understand it:

> This is why the Holy Spirit, who inspired your servant Moses to write, says nothing about times or days when he tells us that you created heaven and earth 'in the beginning'. For clearly the Heaven of Heavens which you created 'in the beginning', that is, before the days began, is some kind of intellectual creature [*ibid*. Bk XII. 9, pg. 286].

As Edward B. Pusey put it, "Augustine . . . explains the 'Heaven' [of Heavens] to mean that spiritual and incorporeal creation which cleaves to God unintermittingly, always beholding His countenance; 'earth' the formless matter whereof the corporeal creation was afterwards formed." Pusey's comment slides back into the same paradox by saying "the corporeal creation was *afterwards* formed," but the general notion to be conveyed might be expressed well enough in terms of two mathematical planes, one incorporeal and *logically* ordered and the other corporeal and *temporally* ordered. Or, perhaps, Augustine's conclusion might be easier to visualize by depicting the natural world as a plane to which one adds a "supernatural

axis" to embed it in within some kind of "super-universe" subsisting in the *Existenz* of God.

But however one tries to grasp it, there is an inescapable element of mysticism to all this that no amount of human reasoning can entirely do away with. It is an unavoidable conundrum one always eventually runs into when engaging in ontological speculation about transcendent noumena of secondary quantities in Slepian's Facet B. Christianity is certainly not the only religion to come up against this mystery. In the Hindu Creation Hymn, *Nasadiya Sukta* [the *Rig Veda* (10: 129)], we encounter,

> Then even nothingness was not, nor existence,
> There was no air then, nor the heavens beyond it.
> What covered it? Where was it? In whose keeping?
> Was there then cosmic water, in depths unfathomed?
>
> Then there was neither death nor immortality
> nor was there then the torch of night and day.
> The One breathed windlessly and self-sustaining.
> There was that One then, and there was no other.
>
> At first there was only darkness wrapped in darkness.
> All this was only unillumined cosmic water.
> That One which came to be, enclosed in nothing,
> arose at last, born of the power of heat.
>
> In the beginning desire descended on it -
> that was the primal seed, born of the mind.
> The sages who have searched their hearts with wisdom
> know that which is kin to that which is not.
>
> And they have stretched their cord across the void,
> and know what was above, and what below.
> Seminal powers made fertile mighty forces.
> Below was strength, and over it was impulse.
>
> But, after all, who knows, and who can say
> Whence it all came, and how creation happened?
> The Devas [gods] themselves are later than creation[2],
> so who knows truly whence it has arisen?
>
> Whence all creation had its origin,
> He, whether He fashioned it or whether He did not,
> He, who surveys it all from highest heaven,
> He knows – or maybe even He does not know.

We encounter similar mysticism in the Tao. Islam inherits the same issues that confronted Augustine because, as Augustine did, it accepts Moses as a prophet and author of the Genesis story. Many Protestant Christians appear to deal with the issue by pretending it isn't there or, if they are aware of it, by avoiding thinking about it – both of which behaviors one finds exhibited by many Muslims as well. It is a problem that clings to ontology-centered people who yearn for *certainty* rather than being willing to settle for *faith*.

One theologian who confronted the issue was Nicholas of Cusa (1401-1464). He developed what is known as the Doctrine of Learned Ignorance. Cusa wrote,

> A finite intellect . . . cannot precisely attain the truth of things by means of a likeness. For truth is neither more nor less but indivisible. Nothing not itself true is capable of precisely measuring what is

[2] Many – probably most – Christians and Muslims are prone to dismiss Hinduism out of hand because of the polytheism that comes to us through translation into other languages. Let me pose a question for you: What is the practical difference between Hindu Devas vs. "the One" and Christian or Muslim angels vs. God?

> true, just as a non-circle cannot measure a circle, for being a circle is indivisible. So the intellect, which is not truth, never comprehends truth so precisely but that it could always be comprehended with infinitely more precision. The intellect is related to truth as a polygon to a circle. The inscribed polygon grows more like a circle the more angles it has. Yet even though the multiplication of its angles were infinite, nothing will make the polygon equal the circle unless the polygon is resolved into identity with the circle.
>
> Clearly, therefore, we know of the truth only that we know it cannot be comprehended precisely as it is. Truth is like the most absolute necessity, which can never be more or less than it is, while our intellect is like possibility. Therefore, the quiddity of things, which is the truth of beings, is unattainable in its purity, and although it is pursued by all philosophers, none has found it as it is. The more profoundly learned we are in this ignorance, the more closely we draw near truth itself. [Cusa (1438), pp. 90-91]

If we put what Cusa is saying here into the context of Critical Philosophy, he is acknowledging what in chapter 2 we called the horizon of human experience. The consequence of applying this to the question "Was there any 'Beginning'?" is that we find *the question itself is not objectively valid* because the notion of "the Beginning" calls for knowing an object ("the Beginning") that lies far beyond the horizon of possible human experience. It calls for an ontological answer for something that lies beyond the reach of ontology. Any answer that can be proposed is going to be a speculation, and any satisfaction gained from holding that speculative answer to be true is entirely subjective. There can be none but a *subjectively* sufficient reason for holding-it-to-be-true. It can never find an *objectively* sufficient reason.

The mysteries of religion and life's many challenges to faith pit the finite quiddity of being-a-human-being against awesome infinities of supernatural objects, our ideas of which lie deep in Slepian's Facet B beyond all possibility of human objective experience. Yet human beings yearn to understand these objects *as* objects and *as if* they were objects of Facet A. In a rare bit of poetic metaphor, Kant wrote:

> We have now not only traveled through the land of pure understanding and taken careful inspection of each part of it, but likewise traveled it from end to end and determined the place for each thing in it. But this land is an island and through Nature itself enclosed in unalterable boundaries. It is the land of truth (a charming name) surrounded by a broad and stormy ocean, the true seat of illusion, where many a fog bank and rapidly melting iceberg pretend to be new lands and, ceaselessly deceiving with empty hopes the seafarer looking around for new discoveries, entwine him in adventures from which he can never escape and yet also never bring to an end. [Kant (1787), B: 294-295]

To confront the mysteries and meet the challenges, we must venture out onto this stormy ocean where objective validity can find no solid ground upon which to be built. What we do have beneath our feet out on this unfathomable ocean is a deck of subjective validity for the erection of faith. This being what we have, it follows that we must carefully examine the subjective foundations of the human power of reflective judgment from which come subjective validity for one's holding-to-be-true. For this we first turn to psychology to examine how a human being constructs an understanding of himself and everything around him. If a man is the measure of all things, as Protagoras declared, we must understand how he takes this measure. If we can understand the human-nature of faith then perhaps from this we can also learn *the good of faith* and, more importantly, how to be faithful *with good will*, for, as Kant also said,

> It is not possible to think of anything at all in the world, yes or beyond it as well, that could be held-to-be good without restriction except a *good will*. [Kant (1785), 4: 393]

2. Naive Beginning

The concept "things begin" develops sometime in early childhood. It is absent in infants at birth because, as psychological research has shown, the concept of "things" is absent at birth. Piaget found,

> In general it may be said that during the first months of life, as long as assimilation remains centered on the organic activity of the subject, the universe presents neither permanent objects, nor objective space, nor time interconnecting events as such, nor causality external to the personal actions. If the child really knew himself, we should have to maintain that solipsism exists. At the very least we may designate as radical egocentrism this phenomenalism without self-perception, for the moving pictures perceived by the subject are known to him only in relation to his elementary activity. [Piaget (1954), pp. xii-xiii]

A great leap forward in the child's mental development is made when he arrives at that golden moment when he first conceives, as a real division, the distinction between "me" and "not-me" and thereby makes himself an object among other objects in his universe. We might say this is the moment when the baby ceases to *be* the universe and instead makes himself into merely its king. We can say this is the moment when the baby *gives birth to his Self as an individual*. To understand faith and its possibility we must try to grasp scientifically how, going forward from this point, he then grows himself into the individual he eventually makes himself become.

The child conceptualizes "befores" and "afters" long before he conceptualizes an absolute notion of "the Beginning of everything." This is obvious from the discussion in chapter 2 of the practical meaning of understanding in terms of "higher" and "lower" concepts and the making of abstractions. The idea of "the Beginning" is a highly abstract idea and before its conception is epistemologically possible the child must acquire numerous experiential examples of "things that began" in his manifold of concepts. These, in their turns, must be logically preceded by concepts of "events" from which he can then conceive concepts that divide up events into "before" objects and "after" objects. It is therefore clear that a child has no *a priori* innate idea of any "absolute Beginning." Rather, a framework for the possibility of an empirically *derived* concept of an "absolute Beginning" must be very gradually built up out of his experience.

"Befores" and "afters" are likewise abstract concepts, although not as abstract as "absolute Beginning." Piaget's research observations demonstrate this. His method was to ask children questions that had never before occurred to the child. In this way he was able to study childish logic and the ways children think. It is worthwhile to take a brief digression and look at two examples he reported from when he was asking children questions pertaining to the origins of the rules of the game of marbles. The young subjects are two five-year-old boys named Fal and Pha. Piaget reported the following conversation with Fal:

> "Long ago when people were beginning to build the town of Neuchatel, did little children play marbles the way you showed me?" – *Yes*. – Always that way? – *Yes*. – How did you get to know the rules? – *When I was quite little my brother showed me. My Daddy showed my brother*. – And how did your Daddy know? – *My Daddy just knew. No one told him.* – How did he know? – *No one showed him!* – Am I older than your Daddy? – *No, you're young. My Daddy had been born when we came to Neuchatel. My Daddy was born before me.* – Tell me some people older than your Daddy. – *My granddad.* – Did he play marbles? – *Yes.* – Then he played before your Daddy? – *Yes, but not with rules!* [said with great conviction]. – What do you mean by rules? – . . . [Fal does not know this word, which he has just heard from our lips for the first time. But he realizes that it means an essential property of the game of marbles; that is why he asserts so emphatically that his granddad did not play with rules so as to show how superior his daddy is to everyone else in the world.] – Was it a long time ago when people played for the first time? – *Oh, yes*. – How did they find out how to play? – *Well, they took some marbles, and then they made a square, and then they put the marbles inside it* . . . etc. [he enumerates the rules that he knows.] – Was it little children who found out or grown up gentlemen? – *Grown up gentlemen*. – Tell me who was born first, your daddy or your granddad? – *My Daddy was born before my granddad*. – Who invented the game of marbles? – *My Daddy did*. – Who is the oldest person in Neuchatel? – *I dunno*. – Who do you think? – *God*. – Did people know how to play marbles before your daddy? – *Other gentlemen played* [before? at the same time?]. – In the way your daddy did? – *Yes.* – How did they know how to? – *They made it up.* – Where is God? – *In the sky.* – Is he older than your daddy? – *No, not so old*." [Piaget (1932), pg. 55]

Fal's answers show that he doesn't connect the idea of "before" with that of "older." Hence his daddy was born before his granddad and is older than God. His concept of "before" is not a *time* concept but rather a sort of *ordering* concept, which in his case has not so much to do with event sequences but rather with maintaining what we might call his *summum genus* belief in his daddy's omnipotence. Fal's concept of "before" seems to have much more to do with what Piaget termed moral causality [Piaget (1930), pp. 261-262] than it does with physical causality.

Another charmingly amusing example is provided by 5½-year-old Pha:

> "Do people always play like that? – *Yes, always like that.* – Why? – *'Cos you couldn't play any other way.* – Couldn't you play like this [we arrange the marbles in a circle, then in a triangle]? – *Yes, but the others wouldn't want to*. – Why? – *'Cos squares is better.* – Why better? – . . ." We are less successful, however, with regard to the origins of the game: "Did your daddy play at marbles before you were born? – *No, never, because I wasn't there yet!* – But he was a child like you before you were born. – *I was there already when he was like me. He was bigger.* – When did people begin to play at marbles? – *When the others began, I began too*." It would be impossible to outdo Pha in placing oneself at the center of the universe, in time as well as in space! [Piaget (1932), pp. 58-59]

Pha, it would seem, does have an absolute Beginning point of reference – namely, *himself*. But this seems to have more to do with an inability to imagine a world without himself than with what we might with a smile call "five-year-old's cosmogony." In an adult we would call his radical egocentrism "narcissism."

A child's construction-of-Reality process happens within an overall framework of naive realism. Piaget wrote,

> In the first three chapters we tried to show that the distinction between thought and the external world is not innate in the child but is only gradually evolved and built up by a slow process. One result of this is of primary importance to the study of causality, namely that the child is a realist in its thought and that its progress consists of ridding itself of this initial realism. In fact, during the primitive stages, since the child is not yet conscious of his subjectivity, all reality appears to be of one unvaried type by reason of the confusion between the data of the external world and those of the internal. Reality is impregnated with self and thought is conceived as belonging to the category of physical matter. From the point of view of causality, all the universe is felt to be communion with and obedient to the self. There is participation and magic. The desires and the commands of the self are felt to be absolute, since the subject's own point of view is regarded as the only one possible. There is integral egocentricity through lack of consciousness of self.
>
> We are thus drawn to a conclusion parallel to that to which we were led by our earlier studies of child logic. In his manner of reasoning, equally, the child is only concerned with himself and ignores more or less completely the points of view of others. But, in logic also, if the child sees everything from his own point of view, it is because he believes all the world to think like himself. He has not yet discovered the multiplicity of possible perspectives and remains blind to all but his own as if that were the only one possible. Also he states his views without proof since he feels no need to convince. The results of this are seen in play, make-believe, the tendency to believe without proof, the absence of deductive reasoning; in syncretism also which connects all things in terms of primitive subjective associations; in the absence of all relativity among ideas; and finally in the "transductive" reasoning which, through the agency of syncretism, leads from one particular view to another, heedless both of logical necessity and of general laws, because lacking in feeling for the reciprocal nature of all relationship.
>
> There are thus two forms of egocentricity, the first logical and the second ontological. Just as the child makes his own truth, so he makes his own reality [Piaget (1929), pp. 166-167].

The sophisticated logico-mathematical reasoning of an Augustine or an Anselm about "the Beginning" requires development of skills of reasoning that no little child has yet acquired. But by ages 4 to 7 years children exhibit curiosity about beginnings and origins. Curiosity pertaining to the birth of babies appears

to touch rather importantly upon a child's development of ideas about beginnings and origins:

> At any rate in the earlier stages, the child seems to experience no difficulty in conceiving beings as, at the same time, living and artificially made. The planets are living, they grow, they are born, and yet they have been made by man. Similarly, mountains, stones, even seeds grow and yet have been artificially made. What is the reason for this combination of animism and artificialism? To solve this problem it would be well to know children's ideas on the birth of babies. . . .
>
> Two types of children's questions are to be distinguished relating to birth, but it is not certain that these two types characterize two stages. Questions of the first type do not touch on the "how" of birth. There is no causality, strictly speaking. The baby is assumed to have existed prior to its birth and the child simply asks *where* it was before that event and how the parents have contrived to introduce it into the family circle. The relation between parents and children is a simple bond and not one of cause and effect: the baby is held to belong to the parents and its arrival is considered as having been wished and arranged by the parents, but no question is raised as to how the baby has been able to come into existence. Questions of the second type, on the contrary, show that the child wonders how babies are made and is spontaneously led to consider the parents as the cause of its creation. [*ibid*., pp. 360-361]

Piaget's specific research question in regard to this quote was to understand the phenomenon of artificialism in childish thought. But the points of special interest in *this* treatise are when and in what manner children first start to built concepts of origins and beginnings. The answer is clear. It happens at a stage in the child's life when he is still deeply anchored to naive realism in his understanding and in his presuppositions. Concepts – important ones – that he makes part of his developed *maxims* of thinking are forming at this stage and, as the psychological research has shown, these maxims are from a very early stage biased toward presuppositions of artificialism – i.e., presupposition that there is some intent or motive standing behind the occurrence of given events and phenomena. There is a kind of timelessness accompanying this presupposition inasmuch as it does not occur to the child to wonder where his parents and other adults came from or even if they were born and were once babies. It is as if he takes it for granted that they have always existed. This is not so much a presupposition of eternal being as it is an utter absence of any notion that the world was ever otherwise than how he knows it. Belief – unquestioned holding-to-be-true – that the world he knows is the only one possible enfolds the child's earliest naive realism. I discuss a theological significance for this fact in chapter 4. Piaget concluded,

> If we examine the intellectual development of the individual or of the whole of humanity, we shall find that the human spirit goes through a certain number of stages, each different from the other, but such that during each, the mind believes itself to be apprehending an external reality that is independent of the thinking subject. The content of this reality varies according to the stages: for the young child it is alive and permeated with finality, intentions, etc., whereas for the scientist reality is characterized by its physical determinism. But the ontological function, so to speak, remains identical: each in his own way thinks that he has found the outer world in himself. [Piaget (1930), pg. 237]

As the child grows and acquires more experience, his specific ideas regarding causality diversify and become more sophisticated [Piaget (1930), pp. 258-273]. One thing he usually *develops* is a belief that everything *must* have a beginning and a source of origin. Belief, once again, is *unquestioned* holding-to-be-true. What the research tells us is that concepts of belief ground later concepts of beginnings and origins, i.e., they are made psychological causes of later concepts regarding beginnings and origins.

Why is this? Ferreting out the correct answer is not easy because this answer is found in the deep core of the phenomenon of mind and goes to the question of *why* human beings think, i.e., the question of what role thinking plays in the phenomenon of being-a-human-being. The Critical understanding of this role comes down to the most fundamental law governing the nature of the phenomenon of mind [Wells (2016)]. Kant can be justly crediting with discovering the *Dasein* of this law and with giving it its name – the categorical imperative of pure practical Reason. But, hampered by the absence of any science of psychology in his day and led astray by his theocentric orientation, he erred in properly understanding the

nature of its *Existenz*. The categorical imperative is properly understood as the first and most fundamental law of human reasoning: to seek and attain a state of ***mental equilibrium***. Its correct statement is: *A human being acts unconditionally to attempt to achieve and maintain overall equilibrium in his state of* Existenz. Failure to robustly re-equilibrate after a disturbance is psychologically traumatic and has devastating consequences. These include various kinds of psychoneuroses as well as debilitating psychoses. The categorical imperative is a formula *defining* control law conditions for equilibration of disturbances. It is effected by means of determination of appetitive power (synthesis of appetition) and experience-driven construction of manifolds of *practical rules* and *concepts of understanding* [*ibid*.].

It would require too lengthy a presentation and take us too far afield from the topic of this treatise to go into great detail about the human-nature of this law and its consequences for the phenomenon of mind. For that, one should refer to Wells (2016) and the references cited there. However, at least the general outline of this can be presented by the mathematical model depicted in figure 1. *Thinking* is represented in this figure by the feedback loop labeled the "free play of imagination and understanding." It is driven by the thorough-going regulation of the categorical imperative in a person's appetition to achieve – even if only temporarily – a state of mental equilibrium. The construction of a person's manifold of concepts is one part of this process and it is because of this unceasing drive to achieve equilibrium that the manifold is driven beyond experiential knowledge and on into speculations of Facet B.

The highest level reached by a person's process of understanding "beginnings" is that of speculation regarding what we might call "the Beginning of all beginning." Practical *maxims of thinking* leading to this speculation are developed and set down during the stages of naive realism. We feel compelled to think there must be a Beginning of all beginnings, but it is a compulsion *we give to ourselves* early in our lives. Once again, "Man is the measure of all things, of things that are that they are, and of things that are not that they are not." Most theologies come to identify this Beginning as God.

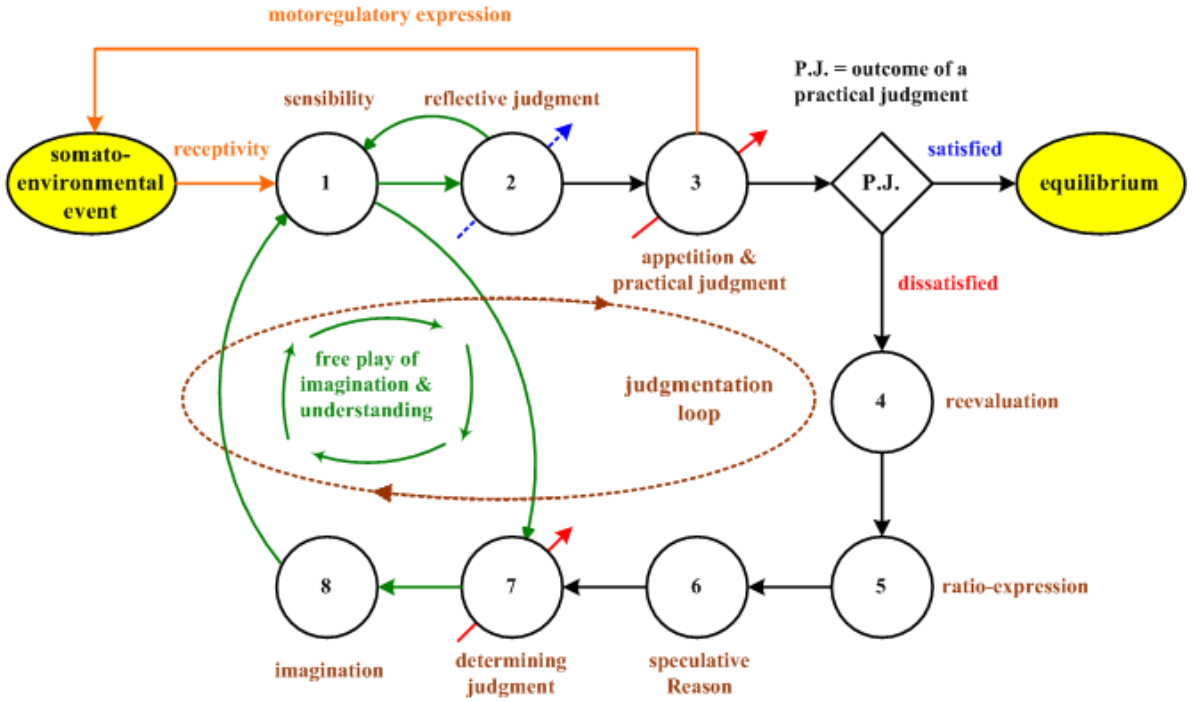

Figure 1: Mathematical model of the synthesis of equilibrium under the law of the categorical imperative. PJ denotes the outcome of a practical judgment of whether the condition imposed by the categorical imperative is satisfied or not satisfied. The circles denote functional processes found to be at work in the phenomenon of mind. The arrows going through processes 2, 3, and 7 denote accommodations in the manifolds of Desires, practical rules, and concepts, respectively.

The child does, as Piaget put it, "construct his own Reality." His earliest basal concepts make up the intellectual aliments of his later understandings of himself and the world around him. Satisfaction of the dictate of the categorical imperative is achieved by employing one or another (or combinations) of what Piaget called "compensation behaviors" [Piaget (1975)]. One of these, the importance of which is often too underrated, is called *type-α compensation behavior* or, more conversationally, *ignórance* (ig-NOR′-ance, the act of deliberately ignoring a disturbing factor). Type-α compensation is the compensation responsible for the phenomenon of *attention* [Wells (2009), chaps. 8, 11]. It is also the compensation making it possible for a person to grab almost any excuse as a reason to stop seeking higher speculations when his efforts to achieve the state of equilibrium demanded by the categorical imperative is frustrated. In this it acts as a kind of "safety valve" compensation. An example illustrating this (and from which we get the expression "sour grapes") is Aesop's fable of the fox and the grapes:

> There was a Time when a *Fox* would have ventur'd as far for a Bunch of *Grapes* as for a Shoulder of Mutton; and it was a *Fox* of those Days, and that Palate, that stood gaping under a Vine, and licking his Lips at a most delicious Cluster of Grapes that he had spy'd out there; he fetch'd a hundred and a hundred Leaps at it, till at last, when he was as weary as a Dog, and found there was no Good to be done; *Hang 'em* (says he) *they are as sour as Crabs*; and so away he went, turning off the Disappointment with a Jest. [Aesop (c. 6th cent. BC), pg. 221]

Before continuing on, there is one subtlety I want to briefly mention because it is all too easy to get into a "logically formal" mindset in a way leading to the false conclusion that the process of judgmentation (denoted as the "judgmentation loop" in figure 1) must *always* and under every circumstance push ever further into ever higher concepts of secondary quantities in Facet B. After all, "one answer leads to another question" is a common occurrence in thinking. Why is it that one often terminates one's thinking about some phenomenon before "the last question is answered"? Logically, shouldn't one continue to ponder and speculate until at last all further efforts at understanding are hopelessly thwarted?

The answer, of course, is "no," and that turns out to be a good thing because if the answer was "yes" we would all get to be pretty psychotic before we were old enough to start kindergarten. It isn't hard to come up with examples to empirically demonstrate it. Here is one of my personal favorites: I have noticed on many occasions a curious phenomenon in my subdivision (which is located in the high plains desert of southwest Idaho). When it rains here (especially when it is a light rain), the driveways in my subdivision appear to get wet before the sidewalks do. One sees large wet patches on the light colored concrete of the driveways before one notices any on the sidewalks. It is a sight that can immediately provoke the question, "Why is it only raining on the driveways?" I wonder about this almost every time we get a rain shower. Yet I feel no burning desire to understand this. I have no plans afoot to mount a scientific research investigation to get to an answer to it and I usually dismiss it with a shrug after a very brief time with the thought, "Boy, that's weird." Why am I not "driven" to find the answer?

The reason is that "curiosity" is not necessarily *a disturbance to equilibrium*. Regulation of thinking under the categorical imperative has a purpose, and that purpose is the elimination of disturbances to equilibrium. My curiosity about this particular phenomenon is what one usually calls an *idle* curiosity. It makes no practical difference to my personal sense of well-being if the driveways get wet before the sidewalks do. Quite likely you yourself have experienced "idle curiosity" once and awhile. Whether curiosity is "idle" or "burning" is a matter of *affective* perception adjudicated by reflective judgment (note the feedback loop from process 2 to process 1 in figure 1). If I wanted to know the answer to the "wet driveways & dry sidewalks" question *more* than I want to avoid doing all the work it would take to obtain an answer, then and only then would I bestir myself to devote time and energy to the question. So far as I know, my neighbors don't pay any attention to or notice it at all – which bespeaks of type-α compensations. A thousand years ago, we might have satisfied ourselves by calling it "witchcraft."

In Critical terminology, "getting the answer" would have to be made a Desire in the manifold of Desires. Unlike the manifold of concepts in determining judgment and the manifold of practical rules in practical

judgment, the manifold of Desires is not constituted as a structure. Desires are not permanent. They are not "remembered" but, rather, "rekindled." Idle curiosities provoke momentary interest quickly dismissed by type-α compensation. Burning curiosity is a sensuous state adjudicated to be a Desire leading to one taking action. To me, the "driveways and sidewalks" phenomenon in my subdivision is one of those "I don't know but I don't really care" kinds of affective conditions. If raindrops were to set my driveway on fire instead, I'm pretty sure I *would* care and *would* take action of some kind. My point with this example is: type-α compensations determine where one's attention and effort get devoted. *Thinking is driven by affective, not objective, judgments*. Let us now get back to the main track of our discussion.

For most people their construction of reality eventually comes to include concepts of the finitude of one's own quiddity. How often does religion, theology, and philosophy remind us that we are "finite beings" and tell us our finitude explains our inability to truly grasp the quiddity of God? Cusa's "Learned Ignorance" doctrine is predicated upon this. "A finite being cannot understand the Infinite" is a concept that provides many people with a satisfactory type-α compensation. Cusa was a bit more refined in how he said it, but that *is* the essence of his argument. He made it a sort of doctrinal type-α compensation. We saw another example of this in the *Nasadiya Sukta* and yet another in Lao Tzu's *Tao Te Ching*.

Concrete *eventual* beginnings and endings are matters of real experience. You stub your toe and feel pain where before there was none. You rub your toe and feel that pain lessen until it ceases altogether. The root meanings of the words "beginning" and "ending" are *practical*; they are bound up in events, to what the Critical Philosophy calls "happenings" or "*Unsache*-things" [Wells (2006), chap. 9, pg. 851].

An *event* is the totality of a series of sensuous appearances connected one to another moment by moment in a subjective intuition of time. As an object, an event is the perception of a *change*-in-Nature. We do not think of this object as a "material thing" (in German, a *Sache*). Rather, its primary attribute is change (what the Greeks called *kinesis* – change of any kind). This change or *kinesis* is an appearance of what we call an "effect." Thinking attributes the *Existenz* of an effect to an otherwise undetermined *cause* and so an effect and its (undetermined) cause are judged together in what Kant called a Relation of causality-and-dependency. "Material things" (*Sache*-things) are, on the other hand, determinately judged in a Relation of substance-and-accident [*ibid*., pp. 850-851]. It is because of this difference in Relation in the *construction* of a concept of a *Sache*-thing, vs. that of a concept of an event, that events are called *Unsache*-things[3].

This change-in-Nature or kinetic attribute of an event grounds the Greek ideas of γενέσεως (genesis) and φθορᾶς (destruction) – which the Romans called *generatione* (generation or coming-to-be) and *corruptione* (destruction or passing-away). Sensuous events are "real world" things, i.e., they belong to Slepian's Facet A. But what about *a* "beginning" or *an* "end"? Their concepts are somehow "contained in" the concept of an event; this is obvious because we say an event "began" and/or "ended." But does a beginning or an end belong to Facet A or to Facet B? This is not so immediately clear. Aristotle thought the questions and problems raised by coming-to-be (genesis) and passing-away (destruction) were so non-trivial that he devoted an entire treatise to the them [Aristotle (c. 347-335 BC)]. In it he remarks,

> The reason why we have not the power to comprehend the admitted facts is our lack of experience. Hence those who have lived in a more intimate communion with the phenomena of nature are better able to lay down such principles as can be connected together and cover a wide field; those, on the other hand, who indulge in long discussions without taking the facts into account are more easily detected as men of narrow views. One can see, too, from this the great difference which exists between those whose researches are based on the phenomena of nature and those who inquire by a dialectical method. [*ibid*., pp. 174-177]

[3] The name Kant gave to the pure *a priori* rules for the construction of concepts was "the categories of understanding" [Wells (2006), chap. 8-10]. Substance-and-accident and causality-and-dependency are two of them. There are twelve of them altogether.

In Critical epistemology the answer is clear. Because "beginning" is originally contained in concepts of events – within which "beginning" is an indistinct representation – the concept of "a beginning" can only be the outcome of making an abstraction from lower concepts. It is what Kantian Logic calls a coordinate concept because it coordinates the structure of two or more lower concepts in the manifold of concepts. Early in the construction process of the manifold of concepts, a concept of a "beginning" includes sensual matter of representation and its form is that of succession in the intuition of subjective time because that is the form of an event. Its sensational mark is what is found commonly in the *change* in sensation, rather than sensation as such, because its form is succession in time. The judgment of its Quality here is made according to an *a priori* rule Kant called the category of limitation. This rule is, in a logical perspective, the notion of a scheme for determining the intensive magnitude of a change in sensation. It is, in other words, a logico-mathematical concept. But that is an attribute we associate with Facet B rather than Facet A. Furthermore, the sensational content in the concept makes this empirical "beginning" the object of a principal quantity of Facet B (see figure 5 in chapter 2). One can rightly say an empirical beginning is **both** a real ***and*** an unreal thing because of its placement squarely bestriding the horizon of possible human experience.

3. Transcendental Dialectic and the Antinomies of Pure Reason

I have observed that statements like this one often provoke a "Huh?" reaction from listeners. Logicians trained in either classical or symbolic logic tend to bristle at them because they claim "a beginning is both a real and an unreal thing" is a self-contradictory statement – and so it is in both these schools of logic. It is not so in the newer school of so-called "fuzzy" logic [Klir *et al*. (1997), chap. 9, pp. 189-214].

Nor is such a statement self-contradictory in Kantian Logic. In it, "X is *and* X is-not" signifies the idea is a *synthesis of opposites*, the outcome of which is the concept of the object. Kant introduced this type of logic [Kant (1787); (1800)] though any honest scholar of Kant's works would have to admit he could have and should have been much clearer in explaining it. It is likely because of shortcomings in Kant's exposition of it that the method is more widely called "Hegelian Dialectic" by the broader community of modern day philosophers. As a conveyor of ideas, Hegel is not at all less obscure than Kant, but he did at least provide some example arguments that illustrated the method a little better. Where he erred fundamentally is that Hegel's metaphysic is ontology-centered instead of epistemology-centered.

Instead of saying "an empirical beginning is both a real and an unreal thing," one can instead express the same idea by saying, "an empirical beginning is neither a real nor an unreal thing." These two expressions are logically identical. Their identity is a consequence of what formal logic calls De Morgan's theorem. As I said a moment ago, these statements signify a synthesis of opposites in Kantian Logic. Consequently both statements are equivalently expressed by saying, "***an empirical beginning is a non-real thing***." The word "non-real" does not mean "unreal." It means that whatever else the object (an empirical beginning in this case) might be, it lies outside the scope of what is meant by "a real object." A term "non-X" denotes what Kant called an "infinite" logical function of understanding in judgment [Kant (1787), B: 95-98]. The word "infinite" here does not refer to mathematical infinity (∞) but instead is used as a synonym for "indefinite." To say "Y is non-X" means that, whatever else Y is, it is outside the scope of "being X." If I tell you "Fred is non-German" I have told you *nothing* about Fred except that he isn't a German. Fred could be a Frenchman, an Englishman, a Scottish terrier, or a brand of whiskey for all I have told you.

The "infinite" logical function is one of twelve such functions Kant introduced. Figure 2 provides a summary table of these twelve functions [Wells (2009), chap. 6]. Kant's logical functions describe the *logical* synthesis of judgments going into the construction of the manifold of concepts in determining judgment. One might call them the "formal" or "mathematical" characteristics of such judgments. As such, they are the "formal logic" complement to the rules for the construction of the manifold that I earlier called Kant's categories of understanding. The logical functions describe the construction of the manifold functionally, the categories describe it epistemologically.

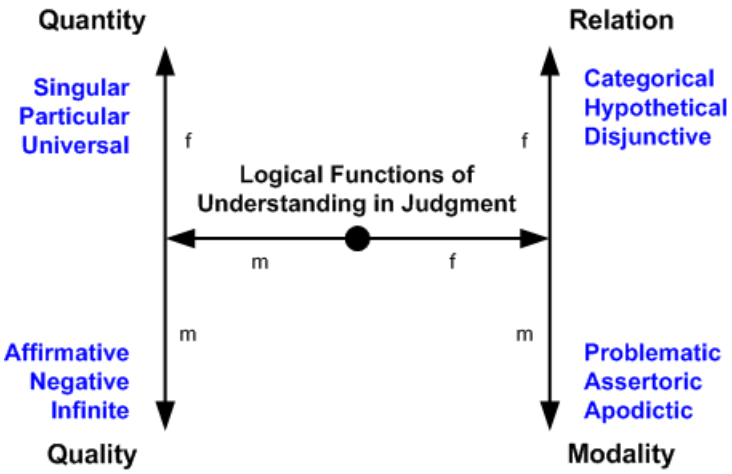

Figure 2: Kant's twelve logical functions of understanding in judgment. Every determinant judgment requires four of these logical functions, one from each of the four headings of Quantity, Quality, Relation, and Modality.

Many traditionally trained logicians have a lot of trouble getting their minds around Kantian Logic[4] because they insist on trying to make it fit within the traditional framework of so-called Aristotelian logic. It doesn't fit within that framework and so usually they end up saying it is "flawed" or "impoverished." In point of fact, it is neither. And, unlike the several versions of "Aristotelian logic" and symbolic logic (also called "mathematical logic"), Kantian Logic is an epistemology-centered logic. Although logicians and others tend to be unaware of it, Aristotelian logics, "symbolic" or "mathematical" logic, and, yes, even modern "fuzzy logic" are all ontology-centered doctrines. For this reason, none of them can be regarded as "laws of thinking." At most they might be called "moral codes" for making formal (and ontology-centered) correct arguments[5] – which is how Aristotle described *his* formal system originally. They cannot be regarded as making statements about the nature of *things* because they make abstraction of all thing-like matter in objects. Their rules were developed with an ontology-centered bias in how one should look at the world but they are not ontologies. W.V. Quine, one of the most influential scholars of 20th century logic theory, gave the following description of these logics:

> The traditional formal logic, dating in its essentials from Aristotle, is nevertheless the direct progenitor of mathematical logic. The striking difference between the two must not be allowed to obscure the fact that they are both "logic" in the strictest sense of the word. They both have, vaguely speaking, the same subject matter. Just what that subject matter is, it is not easy to say; the usual characterizations of logic as "the science of necessary inference", "the science of forms", etc. are scarcely informative enough to be taken as answers.
>
> But if we shift our attention from subject matter to vocabulary, it is easy to draw a superficial distinction between the truths of logic and true statements of other kinds. A logically true statement has this peculiarity: basic particles such as 'is', 'not', 'and', 'or', 'unless', 'if', 'then', 'neither', 'nor', 'some', 'all', etc. occur in the statements in such a way that the statement is true independently of its other ingredients. [Quine (1982), pg. 1]

I would call your close attention to what Quine said about "statements." Making statements has been the principal focus of logic since the time of Aristotle. *Logical* statements, as Quine described them, have a content-free character; they are about "forms" of statements and formal logic is concerned with making

[4] Kantian Logic is frequently called "transcendental logic" because Kant called it by that name. However, since Kant's day there have been other logics – e.g., Husserl's logic [Husserl (1929)] – that are also called "transcendental" logics. I call it "Kantian Logic" in order to distinguish it from these others.
[5] Piaget wrote, "Logic is the morality of thought just as morality is the logic of action." [Piaget (1932), pg. 398]

sure these forms are not self-contradictory, leave no gaps in the logical flow of the argument, and contain no leaps of inference ("jumping to conclusions"). Kant's logical functions of understanding have a similar purpose.

But formal logics, being comprised of logical statements only, do not convey any knowledge of things. This is because these logics deliberately remove all ontological significance from the objects the statements are being made about, leaving mathematical "variables" in their place. This, all by itself, is a first "impoverishment" of Aristotle's original view of what *he* called the science of demonstration[6]. Aristotle wrote:

> The purpose of the present treatise is to discover a method by which we shall be able to reason from generally accepted opinions about any problem set before us and shall ourselves, when sustaining an argument, avoid saying anything self-contradictory. . . . Reasoning is a discussion in which, certain things having been laid down, something other than these things necessarily results through them. Reasoning is *demonstration* when it proceeds from premises which are true and primary or of such a kind that we have derived our original knowledge of them through premises which are primary and true. Reasoning is *dialectical* which reasons from generally accepted opinions. Things are true and primary which command belief through themselves and not through anything else; for regarding the first principles of science it is unnecessary to ask any further question as to the 'why,' but each principle should command belief. Generally accepted opinions, on the other hand, are those which commend themselves to all or to the majority or to the wise [Aristotle (4th cent. BC), pp. 272-275].

Aristotle, the father of science, wanted to understand all of nature and his "logic" was from the very start subordinate to his metaphysics. His metaphysics was ontology-centered (all the ancient Greeks were realists in the everyday context of that word). However, his metaphysics denied that anything could really be mathematically infinite in its extent or in its quality – and that was a huge incompatibility with the later European Scholastics ("schoolmen"), all of whom were churchmen fundamentally concerned with theological questions. I think it was no accident when Aristotle's metaphysics disappeared from the logic of Scholasticism.

Kantian Logic, in contrast to the logics Quine was talking about, has a peculiar kinship with Aristotle's view of "logic." Kant did not, as the schoolmen did, eliminate metaphysics from having a fundamental role in logic. The key distinction between Kant and Aristotle is that Kant's metaphysics is epistemology-centered and epistemology took precedence over ontology[7]. With Aristotle it was just the opposite.

Kant lived during the time of the European Enlightenment, an era that rivals the European Renaissance in importance. The Enlightenment saw the birth and development of the modern scientific method, and it witnessed major clashes between traditional views of monarchy and church and the views of progressive thinkers such as Benjamin Franklin, Thomas Paine, Jean-Jacques Rousseau, and Voltaire, whose views could be expressed by the motto *Sapere aude* ("dare to know"). Against long held theses, Enlightenment progressives threw up diametrically opposed antitheses, and arguments pro and con were waged in the public eye and in academies all over Europe. In many cases, proponents of one argument sought to prove their case by proving the opposing argument was false. The tactic was based on classical logic's Principle of the Excluded Middle: if argument A is false then its opposite, argument B, must be true. Classical logic included Kant's "affirmative" and "negative" logical functions of Quality (figure 2) but did not include Kant's "infinite" function. If the opposing propositions are in fact *contradictory* to one another then the Principle of the Excluded Middle does apply. The problem for Enlightenment thinkers was that *both* sides "proved" the other's proposition to be false – a clear sign that the propositions are merely *contrary*.

[6] Aristotle did not actually use the word "logic" to describe what he was doing. That denomination was added centuries later.

[7] Some modern Kant scholars might raise the issue that the word "epistemology" appears nowhere in the corpus of Kant's works. However, the reason it does not is a simple one. The word "epistemology" was not invented until half a century after Kant's death. Kant's word for it was *Kritik* ("Critique").

By the 18th century it would seem that Scholastic logic had forgotten Aristotle's distinction between contradictory and contrary opposites. At any rate, this seems to be seen in the *practice*, if not the formal *teaching*, of logic. If two propositions are contradictory, one of them *must* be true *and* the other *must* be false. The Principle of the Excluded Middle applies in this case. But if they are merely contrary, then it is possible for them *both* be to false and the Principle of the Excluded Middle does not apply [Kant (1800): 9: 116-117]. When the objects about which propositions are being made are noumena beyond the horizon of possible human experience, the thesis and the antithesis become what Aristotle had called opinions and the pertinent logic becomes dialectical rather than demonstrable[8].

In Kant's day there were four especially notable controversies of thesis-antithesis oppositions receiving attention in Enlightenment debates. Kant called them the "antinomies of pure Reason." These four antinomies are of especial interest to theology[9]. They are:

> **Thesis 1**: The world [universe] has a beginning in time, and in space it is also enclosed in boundaries;
> **Antithesis 1**: The world [universe] has no beginning and no bounds in space, but is infinite with regard to both time and space; [Kant (1787) B: 454-461]
>
> **Thesis 2**: Every composite substance in the world [universe] consists of simple parts, and nothing exists anywhere except the simple or what is composed of simples;
> **Antithesis 2**: No composite thing in the world [universe] consists of simple parts, and nowhere in it does there exist anything simple; [*ibid*., B: 462-471]
>
> **Thesis 3**: Causality in accordance with laws of nature is not the only one from which all the appearances of the world [universe] can be derived. It is also necessary to assume another causality through freedom in order to explain them;
> **Antithesis 3**: There is no freedom, but everything in the world [universe] happens solely in accordance with laws of nature; [*ibid*., B: 472-479]
>
> **Thesis 4**: To the world [universe] there belongs something that, either as a part of it or as its cause, is an absolutely necessary being;
> **Antithesis 4**: There exists no absolutely necessary being anywhere, either in the world [universe] or outside the world [universe] as its cause. [*ibid*., B: 480-488]

Kant pointed out that in each of these four cases it assuredly *seems* like one or the other proposition (thesis vs. antithesis) must be correct (and the other, therefore, incorrect). But in both cases, their proofs rely upon refuting the other argument and then invoking the Principle of the Excluded Middle. We thus are faced with a dilemma because all we end up with is a situation where *both* propositions are logically refuted and there remains no way to settle the dispute in any objectively grounded way [*ibid*., B: 529].

The reason this dilemma arises, he goes on to demonstrate, is that the objects being argued over are pure noumena – mathematical totalities – that lie far beyond the horizon of possible experience. The *objective validity* of the categories of understanding (the pure *a priori* rules for the making of concepts) is restricted

[8] Logic courses in U.S. universities today generally fail to teach students the difference between dialectics and demonstrations. The topic has been made into what is more or less a stale set of rather empty mathematical exercises. Most college students never take a course in logic at all. Of those who do, the majority of them are students of computer science or electrical engineering – and in both cases all "philosophical" considerations are ruthlessly expunged. When I was an undergraduate student in electrical engineering, I had been looking forward to my first course in "logic circuits" because "logic" was something I had desired to formally learn since I was in high school. When the time finally came, words cannot adequately describe how disappointing I found that course to be, or how incredible it was to me that no one else seemed to care how intellectually trivial the material we did study is. My classmates liked the course because it was easy (and a job skill), not because it was educational. It was training; it wasn't education.

[9] These antinomies ought to be of concern to physicists and other students of nature as well, but they aren't. This isn't because science has resolved the antinomies but, rather, because the education and ontology-centered biases of the practitioners produce not Cusa's "learned ignorance" but rather leaves them wallowing in unlearned ignorance.

to validly apply *only* to sensible objects of experience. The objects caught up in the thesis-antithesis dilemma, being transcendent noumena, have no objectively valid *ontological* significance. Instead, Kant tells us,

> a certain transcendental illusion has portrayed an actuality to them [the disputants] where none is met with. [*ibid*., B: 529]

Earlier in this chapter we saw Augustine wrestling with precisely the issue presented by the first thesis-antithesis antinomy. It is interesting to note that *his* resolution of the problem came to rest upon finding a way to accept *both* propositions *together* – a Heaven of heavens for the antithesis and an earth and cosmos existing in a "temporal plane" of human understanding for the thesis.

The example set by Augustine points toward something that is important to clearly understand. The lack of objective validity in all eight of these propositions only means *they cannot be decided* on objective grounds. As today's mathematicians might put it, these propositions are "formally undecidable." Gödel published a rigorous proof that some parts of mathematics are incapable of being proved in 1931 – a discovery that put a stake through the heart of the philosophy of rationalism. *Among these were some of the axioms of arithmetic*.[10] If even something so basic as the propositions justifying "1 + 1 = 2" cannot be formally proved to be objectively valid, what does that say about the decidability of something like "the beginning of the universe"? Kant's analysis of the antinomies can rightly be said to have foreshadowed the discovery of formal undecidability almost 150 years before Gödel's Theorem was published.

What the formal undecidability of these eight propositions (and others like them) means for us in this treatise is: *you* can choose to hold any of them to be true (or false) as you like and no one can ever *prove* that you are wrong. But at the same time, no one can prove that you are right either. Propositions such as those above do not belong to Knowledge but, instead, holding them to be true (or false) with deep conviction can only ever be a matter of *faith*. At the same time, as Kant went on to show, this in no way dooms us to a retreat to skepticism. Skepticism is the view that *nothing* can be known with certainty. There is a great deal we *can* be certain about, including when we have arrived at the boundary of our ability to be certain, when one views the world through an epistemology-centered metaphysic. Gödel proved we cannot be certain the axioms of mathematics are objectively true, but this does not prevent us from using arithmetic to balance our checkbooks or design roads and bridges. Skepticism is the sister of cynicism and, as Oscar Wilde said, "a cynic is a man who knows the price of everything and the value of nothing." *Lack* of proof is not *dis*proof.

There are some who think modern science does not suffer from uncertainty and undecidability and, therefore, scientists can dispense with faith. However, this is not true – something physicist and Nobel laureate Richard Feynman was always quick to point out [Feynman (1965)]. Faith is indispensable in theology but it also is surprisingly important for a great many purposes in everyday life including science.

Kant said of the four antinomies,

> These specious contentions are only so many attempts to solve four natural and unavoidable problems of Reason; there can be only so many of them, no more and no less, because there are no more synthetic presuppositions that bound the empirical synthesis *a priori*. [Kant (1787) B: 490]

By this he did not mean there are only four antinomies; clearly others can be thought up, as Augustine did in his reflections. He meant that there are four *classes* of "cosmological" antinomies corresponding to his four headings of the Rational Metaphysic of Nature [Wells (2009), chap. 2], and these four classes represent the matters and forms of a practical regulative principle of the process of Reason he called *the*

[10] That some propositions, including some that are very basic to arithmetic, are formally undecidable stunned the world of professional mathematics in 1931 when Gödel published his famous theorem [Gödel (1931)].

cosmological Idea.

The cosmological Idea is one of four primitive regulations of ways the process of *speculative* Reason employs the process of determining judgment and regulates the synthesis of understanding in pursuit of satisfying the demands of the categorical imperative of pure *practical* Reason. The general principle of the cosmological Idea is that reasoning seeks absolute completion in series of conditions for Objects of Nature [Wells (2006), chap. 4, pp. 241-254], [Wells (2009), chap. 2, pp. 66-67]. Kant describes the cosmological Idea as a principle that "poses unanswerable problems" for speculative reasoning. By this he didn't mean the Idea "asks questions" Reason cannot find objectively valid answers to; the cosmological Idea (like the other three transcendental Ideas of pure Reason) has objective validity only as a practical regulation of reasoning in the motivational dynamic illustrated by the judgmentation loop of figure 1. He means that the eventual *outcome* of the Idea's effect *creates* additional theoretical problems when some subsequent *disturbance* to equilibrium happens to summon back into judgmentation some of the concepts its regulatory acts previously caused to be constructed.

If it never occurs to you to wonder, "Where did the universe come from?" or if not knowing this doesn't bother you, then your equilibrium is not disturbed by it and you "feel no push" to pursue the matter. Some people – philosophers, theologians, and some scientists – have a professional interest to seek satisfactory answers to such "cosmological questions," but the great majority of people simply dismiss them via type-α compensation – which is a quick way of getting to a state of equilibrium. For the BaMbuti Pygmies of the Congo, that "good things" come to them from their forest is enough to give them a subjectively sufficient reason to regard themselves as "the children of the forest." This answer satisfies them and they take the rather practical attitude that because they don't know *why* the forest chooses to be good to them, it serves no purpose to question a good thing. I am inclined to think the mystical faith the BaMbuti have in their forest is stronger than the faith many a saint has had in Christ. Certainly it is a simpler, more practical, and closer-to-home kind of faith – and perhaps all the stronger because of it.

4. Critical Agnosticism and the First Article of Faith

The Critical conclusion reached in the section above is called *agnostic* when the word "agnostic" is used in its proper neutral connotation. Properly used, it is what logic calls a *modality* term. This means it pertains to *how* you hold a proposition to be true (or false). It pertains not to the object being judged but only to judgment *of* the judgment. A proposition can be held-to-be-true as either *possibly* true, *actually* true, or *necessarily* true (and similarly for propositions held-to-be-false). In Kantian Logic there are three modal categories of understanding. They are: possibility & impossibility; actuality (*Dasein*) & non-being (*Nichtsein*); necessity & contingency. The concept of agnosticism also carries the Quality connotations of the category of limitation and the "infinite" logical function (figure 2). If you say, "I am agnostic about proposition *X*" this is the same as saying, "I do not *know* if proposition *X* is true or false." *At the same time* you can hold an *opinion* that proposition *X* is true (or false). This opinion is in no way antagonistic to being agnostic about proposition *X*. Opinions are subjective, knowing is *both* subjective *and* objective.

However, over the years some people have turned this word and its associated term "agnosticism" into improperly used and pejorative synonyms for words such as skeptic, doubter, doubting Thomas, cynic, unbeliever, or even atheist. It is therefore important to take a moment to clearly explain why "agnostic" does not mean *any* of these things.

The English word "agnostic" was coined in 1869 by biologist Thomas Henry Huxley but its idea by no means originated with him. We find it expressed at least as far back as the 5th century BC by Protagoras in Greece and by the Indian philosopher Sanjaya Belatthaputta. Huxley invented "agnostic" from a Greek word that meant "without *gnosis* (knowledge)." In an 1889 symposium he said,

> Agnosticism is of the essence of science, whether ancient or modern. It simply means that a man shall not say he knows or believes that which he has no scientific grounds for professing to know or

> believe. Consequently, agnosticism puts aside not only the greater part of popular theology, but also the greater part of anti-theology.

Huxley lived during the heyday of positivism in science and so his "scientific grounds" meant "facts gained through experiment and actual experience" – a meaning not-incompatible with Kant's distinction between phenomenon and noumenon. He meant it to be a religiously neutral term, speaking neither for nor against religion, and he was prescribing it as the attitude and approach a scientist should take when acting or speaking *as* a scientist. Inasmuch as people depend upon scientists to provide facts about nature and tell us things known to be true about it, Huxley's "agnosticism" is a sort of moral standard scientists and the practice of science are expected to always adhere to. In private life a scientist is free to be a religious person of faith or not, but at work he is expected to not bias his findings either in favor of or against any opinions or convictions not supported by scientific evidence. Speaking for myself, I fail to see why anyone should find this moral standard to be objectionable.

However, for many centuries before Huxley was born Christian church leaders had been using the word *gnosis* to mean "spiritual knowledge." For example, in the *Didache* ("Teachings"), *c*. 2nd cent. AD, we find,

> 1. Whosoever then comes and teaches you all these things foresaid, receive him. 2. But if the teacher himself be perverted and teach another doctrine to destroy these things, do not listen to him, but if his teaching be for the increase of righteousness and *gnosis* [knowledge] of the Lord, receive him as the Lord. [Lake (1912), pp. 324-325]

It seems to me that, in view of a sort of "prior copyright" to the word *gnosis* among religious scholars, it isn't too surprising that some people of faith read a sort of sinister implication into Huxley's newly invented word. There have been scientists who expressed contempt and ridicule for religion, and it seems to me turnabout is fair play in this regard even though nothing generally beneficial can ever come out of such vainglorious cross-sniping. In *this* treatise "return fire" connotations like skeptic, doubter, doubting Thomas, cynic, unbeliever, and atheist for the word "agnostic" are shunned.

Science can make no legitimate judgments of supernature because the topics of science are strictly confined to making statements about nature only. Likewise, religion can make no legitimate appeal to supernature or to any of the many religious doctrines and writings from any of the divers religious faiths in making pronouncements about *nature*. Scientists *as* scientists have a legitimate Duty to speak against any trespassing of religion into matters within the scope of science. So called "Creation Theory" and "Intelligent Design" theory are two examples of this sort of pseudoscientific trespassing that are worth mentioning. At the same time, it is prudent for people of faith to refrain from *blindly* accepting all pronouncements of scientists as if every scientific pronouncement carried the weight of unquestionable authority. In the history of science there are incidents – quite a few as a matter of fact – when theories (scientific explanations) have eventually been shown to be wrong. There have also been times when a scientific community has failed to be open minded about discoveries or evidence gainsaying their then-accepted doctrine. For examples one can read Kuhn's scholarly history [Kuhn (1970)] or, in a lighter vein, Bryson's *A Short History of Nearly Everything* [Bryson (2003)]. It is no insult to science to ask for the evidence. *All* the evidence. *Understanding* that evidence and the explanation often requires the questioner to have a good science education but does not require the questioner to *be* a professional scientist. Part of being a professional scientist is the ability to communicate scientific reasoning to the lay public (who usually pay the bills for their research through such things as taxes).

I tend to cringe every time I hear a scientist tell people something along the lines of "When a scientist uses the word 'theory' it means the same thing as the word 'fact'." It just isn't true. Epistemologically, a "theory" is "a systematic doctrine of all the principles and ideas determining the phenomenal exhibitions of an Object which stands as the subject-matter of the doctrine." Although the definition is probably a bit too technical for this treatise, in Critical metaphysics a "fact" is "a phenomenon for which the

representation in the manifold of concepts is connected with the assertoric logical momentum of Modality. The category that is the scheme of this representation is the category of actuality & non-being." Facts lie *strictly* within the horizon of *actual* human experience. But a theory, of practical necessity, always involves one or more noumena that serve to connect divers facts to one another in a coherent and self-consistent way. Last night I saw the sun set in the west. That is a *fact*, not a theory. The explanation of the path it traveled across the sky, why the sky blossomed into such a magnificent array of colors, and why the sun disappeared over the horizon at the place where it did *is* a theory. Theories in science are *explanations* held-to-be beyond a *reasonable* doubt based on the empirical evidence currently known. *All* scientific theories are held-to-be-true *contingently* because we never know when some new empirical fact might come to light and cast the current theory into *reasonable* doubt. As Feynman said,

> There is always the possibility of proving any definite theory wrong; but notice that we can never prove it right. . . . In the future you could compute a wider range of consequences, there could be a wider range of experiments, and you might then discover that the thing is wrong. [Feynman (1965), pp. 157-158]

However, the contingency of scientific findings is in no way a *legitimate* excuse for attacking science, as some religious cults are known to do when the finding gainsays some cherished part of their doctrine. The same can be said – perhaps even more strongly – when someone attacks a scientific finding for political purposes. Indeed, I find it difficult to see politically driven attacks on science as anything except venal.

Critical agnosticism is not the same thing as skepticism or cynicism, as I said earlier. It is simply a brake to be applied to speculation because of the limitations of human Knowledge. A question can be asked, though, as to whether it can play a useful part, either positively or negatively, in theology. If agnosticism is a brake to be applied to speculation, what speculations are those to which the brake is to be applied?

When one speculates, one always speculates about something. It more or less follows the course, "If something *A* is *so*, then does that imply something else *B* is *such*?" Theology is speculation that proceeds "from the seen to the unseen," from nature to supernature, from effects to causes. It tries in this way to forge a rational connection between what we can know by experience to what is unknowable to us by experience. It seeks to transcend from noumena of principal quantities to noumena of secondary quantities. In this climb it inevitably encounters mysteries – things not understood or beyond understanding, or seeming to possess profound or inexplicable qualities or characters. These things are occult, i.e., they involve supernatural agencies. How can one even try to comprehend such things? *Should* one try to comprehend them outside of applications such as the study of human psychology?

In Western civilization today some people habitually dismiss outright any suggestion that speculations regarding occult qualities might prove to be useful or contributive to any good result. Since the time of Isaac Newton and the European Enlightenment "the occult" has been explicitly banned from explanation in the practice of science. Newton wrote,

> These Principles I consider, not as occult qualities supposed to result from the specific forms of things, but as general Laws of Nature by which things themselves are formed, their truth appearing to us by phenomena though their causes be not yet discovered. For these are manifest qualities and their causes only are occult. And the *Aristotelians* gave the name of occult qualities, not to manifest qualities, but to such qualities only as they supposed to lie hid in bodies, and to be the unknown causes of manifest effects . . . Such occult qualities put a stop to the improvement of natural philosophy, and therefore of late years have been rejected. [Newton (1730), pg. 401]

Critical agnosticism can certainly be put to use for the purpose of trying to identify where possibilities of "manifest qualities" end and "occult qualities" begin – and, in an age when habit and education have produced ignorance of philosophical inquiry, doing just this much can be an important contribution. But curiosity and speculation regarding matters of religion and even of superstition are likely – at least

according to speculations by some historians – to have played a key role in the invention of science itself. Historian Will Durant wrote,

> Magic begins in superstition and ends in science. . . . Frazer has shown, with the exaggeration natural to a brilliant innovator, that the glories of science have their roots in the absurdities of magic. For since magic often failed, it became an advantage to the magician to discover natural operations by which he might help supernatural forces to produce the desired event. Slowly, the natural means came to predominate, even though the magician, to preserve his standing with the people, concealed these natural means as well as he could and gave the credit to supernatural magic . . . In this way magic gave birth to the physician, the chemist, the metallurgist, and the astronomer. [Durant (1935), pp. 67-68].

Manic speculation – such as that we see exhibited by young children – is unlikely to lead to anything but unstable and internally inconsistent beliefs heaped upon one another like so many round stones in a construction that crumbles in a light breeze. This sort of intellectually primitive romancing is one thing Critical agnosticism can certainly put a stop to. More important is the discipline it can bring to nuanced mathematical reasoning in conceiving objects of facet B. Cusa wrote,

> All our wisest and most divine doctors[11] concur that visible things are truly images of invisible things and that from creatures the Creator can be seen in a recognizable way as if in a mirror or in an enigma. But the fact that spiritual things, unattainable by us in themselves, may be symbolically investigated rests on what we have already stated. For all things in relation to each other stand in a certain proportion that is hidden and incomprehensible to us so that from all things one universe arises and in this maximum all are this one. . . .
>
> Now, when an inquiry proceeds from an image, there must be no doubt about the image in transumptive proportion to which the unknown is investigated; for the way to the uncertain is possible only by means of what is presupposed and certain. But all sensible things are in a continual instability because of the material possibility abounding in them. However, where such things are considered, we perceive that those things, such as mathematicals, which are more abstract than sensible, are very fixed and very certain to us, although they do not entirely lack material associations, without which no image of them could be formed, and they are not subject to fluctuating possibility. And so in mathematics the wise ingeniously sought examples of things that the intellect was to investigate, and none of the ancients who are regarded as great undertook difficult questions by any other than mathematical likenesses. [Cusa (1438), pp. 100-101]

There is much that is very Kant-like in this. Cusa calls our attention to the fundamentally mathematical character of theological inquiry. His "mathematicals . . . more abstract than sensible" which "do not entirely lack material associations" are noumena of principal quantities. They are "presupposed" as necessary conditions of the phenomena with which they are associated and, for the human phenomenon of mind, they are certain inasmuch as their *Dasein*, although not the manner of their *Existenz*, is required by the laws of the human capacity for understanding. Although they lack valid *ontological* significance, their *epistemological* significance could not be greater.

Cusa's "mathematicals" are the seaport from which theology sets sail in its voyage out onto Kant's "stormy ocean." Their "material associations" lie in phenomena of facet A, and the "image" at the point of departure we obtain by understanding phenomena. This includes not only the "dead matter" objects that make up the field of study in physics, chemistry, and biology[12], but also understanding of the nature of being-a-human-being in our studies of psychology, the nature of human associations and societies, the

[11] In Cusa's day, a learned or authoritative teacher was called a "doctor." We still follow the practice today by giving a person who holds a PhD degree the title "doctor" regardless of that person's field of scholarship.

[12] If my calling the objects of biology "dead matter" startles you, refer back to the previous quotation from Claude Bernard in chapter 1.

lessons of history, and all the other endeavors in what I call "social-natural" sciences [Wells (2012), chap. 1]. We bring these "images" into focus by asking, "**What might the nature of being-a-human-being be able to tell us about a Critical theology**?"

But if one is to undertake the sea voyage of theology, it is prudent not to leave port without some idea of the voyage's desired destination. From the moment the inquiry gets underway it at once encounters the noumena of secondary quantities, and these are as plentiful and diverse as human imagination makes possible. Some star is needed to guide the journey for we do not know where or if the human capacity to speculate might end. It is wherever, and if ever, this might be that is the proper intended destination of theology. Cusa called this the "maximum." He wrote,

> I call "maximum" that beyond which there can be nothing greater. Fullness, of course, is what is proper to what is one. Thus, unity . . . coincides with maximumness . . . Accordingly, the maximum is the absolute one that is all things, and all things are in this maximum, for it is the maximum. [Cusa (1438), pg. 89]

Cusa gave this "absolute one" a name. He called it God, and he pointed out that the faiths of all the nations he knew about did the same. Cusa's "maximum" has its counterpart in Kant's transcendental Idea of rational Cosmology, i.e., "absolute completeness in series of conditions for Objects of Nature."

If one chooses to embark on the sea journey of theology, this decision is nonsensical unless one also chooses to have faith that the port of destination is "out there somewhere." You can be loaded with doubts about whether you will ever come to it, but if you hold-it-to-be-true that there is no destination at all, what could possibly motivate you to set sail in the first place? A yearning to be seasick?

This faith in at least the possibility of the destination is what in this treatise I call the *first article of faith*: **God exists**. This article states nothing more than the *Dasein* of God; by itself it says nothing at all about the manner in which God exists, i.e., the *Existenz* of God. Exploration in search of the latter is what the journey is, in large measure, about. If you would undertake this journey, read on. If you choose to decline to make it, then here is a good place for you to stop reading and turn your attention to other things.

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