(SLIDE 1) **Science's First Mistake**

Today I want to talk about my new book, *Science's First Mistake*, co-authored with my good friend Dionysios Demetis. Both of us are ex-scientists (Dionysios is an ex-physicist; I'm an ex-mathematician). Quite independently, we had been harbouring doubts about the scientific method, and we resolved to write a book in which we would list our concerns. The book was six years in the writing; and was finally published in July 2010. The good news is you can download a free PDF. Just follow the instructions on www.sciencesfirstmistake.com .

Our initial inspiration was two quotations by Niklas Luhmann: "The world is observable, because it is unobservable"; and "the condition of its possibility is its impossibility".

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According to Luhmann, when observing we create distinctions, without which we would be unable to observe. Each distinction cuts up the world into two parts: the observable and the unobservable. What he means is that our cognition would be swamped if all the data in the world entered our senses.

Data must be filtered. That filtering comes with the structural coupling of observation and cognition, and takes the form of

delusions, a false reality. For we are not in communion with the cosmos. Our world is unknowable, yet variously interpretable.

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Cognition does not deliver an ‘explanation’ of our world, merely a convincing description! “We call it ‘explanation’, but it is ‘description’ which distinguishes us from earlier stages of knowledge and science. We describe better – we explain just as little as any who came before us” (Nietzsche).

We project our delusions onto the world, and these thankfully enable us to negotiate that world more or less successfully. Propping up these delusions is a belief in atomism, in observed categories – the Science’s First Mistake of the book’s title.

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When we categorize, human cognition separates each data object, each thing, from everything else: its complement – its residual category. In this way we describe, model, analyze, and thereby try to control the world, but in doing so we restrict access to each object. For there are tacit properties of the ‘whole’, latencies, which are not apparent when observing any particular thing. That object remains structurally coupled to everything else in its residual category. However, observation brings that one thing to the fore, by treating it as a stand-alone item.

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The distinctions implied in this separation then cut the couplings, and the latencies vanish from the observation.

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Therefore in observing we introduce an abstraction, an asymmetry between the world as it is, and as it is observed. Hence all observation is conditional, although those conditions are necessarily unobservable, unappreciable, uncertain. Truncated latencies, so casually discarded by observation, stay on as uncertainties. Luhmann calls them paradoxes, and these can reassert themselves in the most inconvenient ways. With each new abstraction of the 'natural world', our descriptions become more 'unnatural'. Such is the human condition! There is no escape.

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"When observers continue to look for an ultimate reality, a concluding formula, a final identity, they will find the paradox. Such a paradox is not simply a logical contradiction (A is non-A) but a foundational statement ... Nothing can be observed (not even the "nothing") without drawing a distinction, but this operation remains indistinguishable".

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All such distinctions come with paradoxes. So let's get one thing quite clear: there's no such thing as holistic thinking. Humans think linearly, unnaturally, via categorical delusions – end of story.

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Our so-called explanations of the world come about by our cognition analyzing fragments of such linear categorical data. But this is not explanation, only mere description. There can be no answer to the question why? ... only to how?

For categories are not truth, merely some prejudged priority, some act of choice ... albeit a necessary choice, that says it is OK to treat similar things as though they are the same, and then to assume that all comparisons between such data-choices are absolute facts. As time moves on, or the perspective or the environment changes, then the category becomes less certain. The meaning of category depends on many things, including the socio-economic context within which it is embedded.

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The UK Office of Government Commerce was very happy with a new corporate logo for their website, mouse mats, pens, etc. The OGC is “an organization that is looking to have a firm grip on government spend!” That’s not all they took a grip on.

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They should have turned the logo through ninety degrees. However, categories are our way of differentiating meaning. As the context becomes vague, so does meaning. All data is context sensitive. There are no such things as absolute facts.

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“A fact is like a sack. It won’t stand up until you put something in it.” A fact is merely an approved communal judgement. A fact does not exist until an observer places it among his/her personal categories. But each category is a delusion that emerges when observation cuts up the world into an observable and an unobservable part, and without which observation would not have been possible to begin with.

Why do we ignore this fundamental error? Because the assumption of ‘sameness’ that comes with category throws up temporary regularities, that are nonetheless useful. These we use as the basis of maps that guide us through the turbulence of existence. Cognition is built upon what is taken for granted in an ever-expanding set of delusions, by creating a set of reflexive and convincing descriptions.

Any analysis, therefore, only requires a consistency between what is necessarily so, and the categories used to give the world meaning. Meaning doesn’t uncover causes in the world, for causality is not in the world, rather it is part of the way we impose meaning. That having been said, the world itself is not arbitrary, but neither does it operate ‘because’ of anything. It is, as it is.

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We humans simply stumble around; thankfully with the capacity to project the delusion of order onto the world. Then we fish out regularities, but with numerous interpretations at various levels of sophistication, although all restricted by linear causal thinking.

Causality is a blunt instrument that convinces us of the validity of our interpretive delusions. This is hardly surprising since causality is the self-referential argumentation we use to convince ourselves. Causality, in whatever form, is merely a means of describing, and the basis of questioning; but one that itself cannot be questioned.

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When solving problems, we resort to category, causality, and the error of sameness. In doing so we ignore the debris of detail, the pollution of discarded couplings created by previous observations. Ultimately, however, the debris will conspire to upset any analysis. Initially our categories are aligned, and don't cause trouble – which is how we perceived each descriptive delusion to start with. But as observations combine, and as time moves on, complexity increases, ... the alignment falters. Hence, there can be no solutions, only contingencies!

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The utility of category is in abstraction, which is why mathematics is so useful: maths is all about operations between abstractions.

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Although, even in mathematics the implicit yet forgotten pollution can reassert itself in the most devastating ways. But I can hear you say “The figures don’t lie”. Not according to Mark Twain: “It’s not the figures lying, it’s the liars figuring”, like every manager come budget time! And yet numbers do lie. Numbers are lies:

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what Nietzsche calls ‘instrumental fictions’. “For the invention of the laws of numbers was made on the basis of the error, dominant even from the earliest times, that there are identical things (but in fact nothing is identical with anything else).

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The assumption of plurality always presupposes the existence of something that occurs more than once: but precisely here error already holds sway, here already we are fabricating beings, unities which do not exist.”

Categories are errors, and so numbers are errors – albeit useful ones. They enable us to count similar things as though they are the same. This opens the way for measuring, and weighing. Subsequently, we keep on counting things, and counting, and counting, until suddenly we make a massive qualitative leap, and posit infinity as the ultimate conclusion of counting.

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We are told that infinity is even larger than the number of atoms in the universe. Larger even than the number of any category of thing. But doesn't that mean we run out of things to count before reaching infinity? Infinity is brimmed full of such paradoxes.

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We are also told the number of even positive integers equals the number of integers! Absurd! Surely it should be half the size. However, for every integer there is an unique even integer that is larger: just multiply by 2. Then we are told that infinity plus 1 equals infinity; Infinity times two equals infinity; and 1 divided by infinity equals zero. But infinity isn't a thing, and so the notion of equating something with infinity is quite absurd. Arithmetic doesn't work at infinity! But who cares as long as it's consistent within the self-reference of mathematics. It doesn't have to have a meaning; mathematicians just overlook the paradoxes, and expand the application of their subject. Infinity doesn't exist, so it must be

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posited as an axiom; which it what Russell and Whitehead do in their 80+ page proof of "1 plus 1 equals 2".

Suppose S is sum of the series 1 -1 +1 -1 +1 -1, and so on. Shift the series one place to the right, and add the two together. 2S equals 1, so S is a half! The sum of integers is a fraction! Absurd!

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Of course the series flip flop between 1 and 0, so there is no single solution. Here a tried and tested technique delivers an answer, implying that the production of an answer from a mathematical method does not in itself show that a solution exists.

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It's just like the famous mathematician John von Neumann says: "in mathematics you don't understand things. You just get used to them." However, once mathematicians got used to the idea of infinity, its paradoxes could be denied, and infinity could be used quite casually across all mathematics. Then German mathematician Georg Cantor asked: how big is infinity?

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By treating infinity as a 'thing' within the context of set theory, he went on to uncover other, even 'larger infinities'. Of course this only makes sense within mathematics itself, and then only by accepting Cantor's set-theory trick of capturing infinity in a set.

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Many of his contemporaries had their doubts. Another mathematical great, Frenchman Jules Poincare, said: 'set theory is a disease from which mathematics will one day recover'. You can tell from his expression that he isn't joking. However, mathematics hasn't recovered. Today set theory is an integral part of modern mathematics.

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No one bats an eyelid at infinity having a size, or the ‘fact’ that one divided by infinity is zero. And where did zero come from?

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How can zero be an integer, when integers are found by counting, but zero comes from NOT counting? It comes from the self-reference of subtraction, as do negative numbers. However, zero can then represent both the absence of something, and the presence of nothing. Zero is simultaneously the something that is not, and the nothing that is – both paradoxical concepts.

Nevertheless this schizophrenic entity zero is very useful, as are negative integers, and fractions, real numbers, algebraic numbers, transcendental numbers, complex/imaginary numbers – as if all numbers aren’t imaginary; all magicked out of nothingness by the self-reference of mathematics.

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However, each comes with their own paradoxes. No matter! Once an internally consistent mathematical idea finds a utility, or at the very least is deemed interesting, it will be accepted subsequently as being sensible, as convincing, no matter how strange, paradoxical, or absurd it may be. It is unimaginable that we should think otherwise. But “What convinces us is not necessarily true, it is merely convincing.”

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"... our fundamental tendency is to assert that the falsest judgements ... are the most indispensable to us, that without granting as true the fictions of logic, without measuring reality against the purely invented world of the unconditional and self-identical, without a continual falsification of the world by means of numbers, mankind could not live – that to renounce false judgments would be to renounce life, would be to deny life [...]".

Once we have numbers, it is a short step to geometry ... and measurement, another instrumental fiction. Here the nature of paradox is clearly illustrated by reference to the humble 'point' and 'line': abstractions at the core of both measurement, and

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mathematics, "which would certainly not have originated if it had been known from the beginning that there is no exactly straight line in nature, no real circle, no absolute measure"; and indeed, no point. Humanity both lives, and is trapped in three dimensions. There can only ever be imaginary and thus paradoxical excursions into lower or higher dimensions; all are flights of fancy.

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A point must be imagined into existence as both a spherical dot (albeit a very small blob), and for the practical purposes of

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calculation one that has no size, no dimension, no substance. A point is simultaneously there, but not there: a paradox. A line is imagined as a very thin rectangular block in three dimensions, with length but very small breadth and depth; for if it had no breadth or depth it would disappear.

The trick for the mathematician is to keep all the images in mind; to remain in three dimensions with the blob and block stopping the objects disappearing, and to move seamlessly among the lower dimensions to undertake calculations without being dismayed by trans-dimensional intellectual travels.

Then mathematics links the notion of point and line. There are no holes in a line; it is a continuum, but not of points. No matter how close two points are to one another, there is always an infinite number of points in between. Mathematicians get around the paradoxes by ignoring them. For example they consider the set (0,1] on the *real line*: all numbers between 0 and 1, but not including zero. Whereas [0,1] includes zero. Not that there is such a thing as a line, but we let that pass. How easily they drop in the now real number zero - no longer an integer, and it is assumed the difference doesn't matter. Zero is simultaneously treated as both a discrete object (a thing), and a no-thing, without substance, which

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can be tacked onto the front of a line without extending its length. In other words they treat that zero as both the presence of nothing, and the absence of something. Does the difference matter?

To avoid the paradoxes, mathematicians resort to their ‘get out of jail free cards’, using phrases like ‘tends to zero/infinity’. However, if such ritual incantations do not work for you, and you are troubled by all the paradoxes; if you can’t do the necessary mental gymnastics to somersault over them; if you cannot ignore the absurdity of contrasted and yet incompatible situations in the paradoxes, then mathematics is not for you.

Those who can do the trick simply deny the very awkward paradoxes that confront them. Luckily, repeated use of mathematical methods breeds contempt for the paradoxes; and the utility that comes with the techniques, only serves to justify the contempt. Eventually the paradoxes lie buried deep beneath familiarity. “in mathematics you don't understand things. You just get used to them.” Intelligence is the ability to deny absurdity.

Once we have measurement, we have science. Modern science is grounded in *mathematics*. Indeed, an instrumental belief in this unnatural mathematics permeates all the so-called ‘natural

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sciences'. The more sophisticated the theoretical description, the more unnatural it is. How strange?

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As Nobel-prize winner Richard Feynman said, "mathematics is not a science from our point of view, in the sense that it is not a natural science … the test of its validity is not experiment". "Why should physics be inherently mathematical?" That fact that sciences are constructed upon a non-science does create a fundamental *epistemological* paradox.

I can still remember being deeply troubled as a schoolboy, when I was told about Centre of Gravity. I found it hard to believe that for any object, gravity would act at a single point. Even then I knew a point has no size, no substance, it isn't there; and yet gravity is supposed to pull at it, thereby dragging the whole object along. This would happen even if the centre of gravity is outside the body, as in the case of a doughnut. How silly! And yet for centuries this interpretation seemed perfectly reasonable. I too gradually assumed it made sense because I found it easy to pass exams. I just went along with it. I underwent the rights of passage.

I also went along with the Inverse Square Law. I could bore a hole through the centre of the earth, drop in a billiard ball, and 'prove'

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it exhibited simple harmonic motion. Although I was concerned about the infinite force that would occur if ever the two centres of gravity coincided - with the distance now zero, mass over zero squared is infinity! I was fobbed off by my teacher saying “two objects can never occupy the same point in space” - that’s both having your cake and eating it!

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The Inverse Square Law is still being taught in schools despite Einstein disproving Newtonian mechanics a century ago. Sir Isaac Newton and Albert Einstein: both men provided widely accepted descriptions of the world around us; both changed the way we view reality, and in particular gravity, the phenomenon of things falling in an apparently consistent manner.

However, Newton’s apple didn’t fall because of the force of gravity described in his mathematical formulation; it fell because that’s what apples necessarily do, along with all other objects on this planet. What Newton did, was to come up with a concept of gravity to describe that necessity.

Following the publication of *Principia Mathematica* in 1687, right up until Einstein, Newton’s law of universal gravitation and his three laws of motion have produced many useful scientific

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advances; and yet they are not strictly true. Newton's description inevitably involved paradoxes, not least being the notion of the 'force of gravity'; but we had to wait for Einstein to highlight that.

According to Newton any two bodies are attracted by a *force* that is proportional to the product of their masses, and inversely proportional to the square of the distance between them. How does the force come into existence when it requires a measurement of both the masses and the distance between the two bodies. Yet each body, whatever 'it' is, has no observation/cognition of the other's existence, or means of measurement? It all sounds like magic.
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A mischievous Nietzsche quotation comes to mind: "When one rows, it is not the rowing that moves the ship; rather rowing is simply a magical ceremony by which one compels a demon to move it".

Apparently each body sends out mystical sub-atomic probes to every corner of the universe, enabling the body (of whatever size) to sense and 'calculate' the forces acting upon it from the instantaneous feedback it receives, as the gravitational force has unlimited range. How does gravity 'decide' what the apple is, what the unity of each body is; where it starts and ends?

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How does each atom or particle send out probes? The gravitational force then acts at the centre of gravity, which happens to be a point: even an atom isn't a point! Even a particle isn't a point – or should we be talking about waves? Or is that yet another paradox?

All these ideas are intrinsically non-sensical, but they have a utility. For centuries, that utility routed all nihilistic objections, despite the ideas being wrong. Newton's interpretation of gravity was accepted because it works for most practical applications.

It enabled us to fire projectiles over large distances with great accuracy, to calculate the orbits of the planets except for a slight problem with Mercury, and even to send rockets to the Moon. And because it worked, because it works, few until Einstein asked how each body can sense the infinite number of others out there, and move along a mathematically prescribed trajectory.

So how does gravity work? How else, than by the necessity (of a Nietzschean demon) that somehow makes what happens in the world of phenomena correlate closely with our models? Many scientists then make a leap of faith, from correlation to a scientific causality, and insist that the world acts according to our models.

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However, after Einstein, gravity is seen as the background, the continuing necessity, the eternal normality against which everything operates, and which is structurally coupled to that everything. It is a field, and not a force. An apple doesn't fall because of gravity, it falls *because* it happens to be in the vicinity of masses that create a gravitational field by bending space. Hence gravity doesn't just suddenly swing into play. It's not the application of a force that makes the apple fall. Falling is what everything on this planet does naturally, necessarily. Something stopping it fall has to be taken away. Everything in space moves relative to gravity, not because of it. Gravity is always and already everywhere. It is NOT a force. Gravity is a function of mass, rather than a force exerted by the mass. Mass bends space and hence objects fall because the space they find themselves in is bent. Richard Feynman admits that:

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"It was a shocking discovery, of course, that Newton's laws are wrong, after all the years in which they seemed to be accurate. Of course it is clear, not that the experiments were wrong, but that they were done over only a limited range of velocities, so small that the relativistic effects would not have been evident. But nevertheless, we now have a much more humble point of view of our physical laws – everything *can* be wrong!"

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I interpret Feynman as saying Einstein too can be wrong, although because we are currently convinced by relativity, we too are blind to the paradoxes that inevitably lie at the core of that particular description; indeed at the core of every description. The scientific approach delivers only a form of tunnel vision with a clear central focus, but with the ambiguity of paradoxes at the periphery. If the problem is on the axis of the tunnel then everything is fine.

Move out of focus and paradoxes cause problems. Of course any identified paradox can be clarified by pulling it into the tunnel with a further sophistication of the system. However, extra sophistication merely narrows the tunnel, and introduces yet more paradoxes that, should they prove non-problematic, we can, and do, deny. With that denial, faith in the explanations is reinforced as we become convinced of their validity. However, step outside the tunnel of our comfort zone, and no longer in denial, the explanations will soon start to appear absurd.

We are all at the mercy of the Fates, and while science may masquerade as a force for control, its tunnel vision conceals an underlying torrent of problems. Theory is merely an attempt to point a specifically-generated tunnel of vision at generalized problems. Hubris comes with an unquestioned belief that

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the scientific method can somehow avoid paradoxes, particularly when it is targeted at social/political/commercial concerns, and especially when it involves technology.

Science is a perpetual search for new ideas.

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Consider the latest theoretical development of unparticles, which leads on to an entirely different kind of matter: one that exudes an ungravitational force. Regardless of how many different ways that gravity may be framed, the fact that more than one is possible means that an important issue circumscribes the attempt to define gravity itself. Ontologically, the simultaneous existence of different acceptable representations of the same property creates a problem that has severe epistemological consequences: what sort of reality exists that allows for the concurrent production of similar yet different representations? Surely the very possibility of drawing different distinctions for the so-called concept of gravity negates the intrinsic objectivity that the descriptions are supposed to encapsulate. So how then are we to make sense of all these differences? How is this paradox to be resolved?

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How is ungravity through unparticles even possible? Why, by simplification through denial, of course! Without the suppression

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of these paradoxes, we cannot achieve a consensus on what we may refer to as gravity. I find genuinely bizarre that even in the most *natural* of all scientific disciplines, namely physics, totally artificial and thus unnatural linear expectations become incorporated into the discipline itself without raising a single quizzical eyebrow, just so that the paradoxes in theories may be suppressed. However, these paradoxes do remain, and will go on to influence the way the theory and the discipline evolve.

For example, physics stretches credulity far beyond any normal expectation with multiple universes (in quantum theory); and indeed in the notion of quantum theory itself; and in the ununiverse (in unparticle physics).

If we were to ask the scientific community empirical questions such as: ‘how can you prove that multiple universes exist?’ or ‘can you show us an ununiverse?’ then these questions would be met with distain. This is unsurprising since the disdainful community is utilizing as axioms the very presuppositions embedded in our questions. They accept any findings derived from their original artificial, unnatural, and linear assumptions without comment, and give them the status of being objectively true.

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To what extent reality is objectively captured in this process, or is reconstructed by the interplay of unnatural/natural (linear/non-linear) assumptions, remains highly problematic.

Science, like mathematics, like every field that claims to produce knowledge, is a product of observation. Any process built upon the requisite categorization and abstraction will be awash with paradoxes, which take us further and further away from the natural world towards an unnatural contrivance.

Paradoxes always have the potential to conspire against the observer. Arguably the best-known example of this is Heisenberg's Uncertainty Principle, which states that it is impossible to measure simultaneously with any degree of accuracy both the position and the momentum of an electron.
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Maybe every time a new (quasi)particle is discovered/posited/ observed in order to fill a gap in theory, the trailing structural couplings will interfere with empirical experiments, and require even more particles to fill yet more gaps in theory. Shockingly, about 30% of the fundamental particles being modeled in today's particle physics are 'hypothetical'. The only evidence of their existence is their necessity to fill gaps in the equations.

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However, solutions always ‘multiply, proliferate, disperse, circulate, diversify, diffuse the original problem’. The multi-billion dollar Large Hadron Collider that came online on 10 September 2008 is leading the hunt for the Higgs boson, the God particle, an ‘explanation’ of how the universe holds itself together.

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However, the Collider has been an embarrassing chapter of accidents from day one. Some scientists even suggested that the Higgs boson might be “abhorrent to nature”. Apparently the collider is sabotaging itself from the future. These are the same people who are inventing all the hypothetical (quasi)particles! Their present model is now so hyper-complex, that it is difficult to justify that it simply popped into existence in a random way. Will we soon see Physicists putting it all down to Intelligent Design – God did it?

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Was Moondog,, the blind New York poet, closer to the mark?

> What I say of science here, I say without condition
> that science is the latest and the greatest superstition.

These same physicists tell us that our world of solid matter is actually an illusion. To them most of it is empty space, sparsely occupied by elementary particles (that, of course, are not illusions). The effect of various forces at this fundamental and

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minuscule scale, acting upon and between the various bits and pieces down there, is mistakenly experienced as solidity by us up here at the scale we humans inhabit.

However, their world of fundamental particles cannot be viewed with direct observations, rather it has to be imagined into existence in hypothetical models and measured via proxies. And there's the rub! The categorizing metaphors that created this world of particles must ultimately be based upon observations experienced in this world we inhabit: a world that was rejected as being mistakenly solid. Quite a Paradox, or just absurd?

The theory that created this model world of particles started with atoms; imagined into existence as space scantily occupied with the collisions of tiny billiard balls. That was replaced self-referentially by another metaphor where particles were also waves, and yet more paradoxes. The function of these metaphors is to impose the illusion of meaning on the micro world with the use of models, which were formed in, and thus can never fully leave this solid macro world we inhabit.

Thus we have entered a never ending loop, where ideas based in metaphors have ultimately to deny others in a vain attempt to

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avoid the paradoxes and absurdities. On each trip around this loop, the denial has to be supported by the creation of an ever more sophisticated variation of the original idea; but that too must be based in metaphor, with its own paradoxes, which again must be avoided with another even more sophisticated variation. This is what Nietzsche called ‘refined ignorance’, or as I call it: *absurdity*.
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Researchers in particle physics are operating at such a minuscule scale that the notion of dimension is destabilized as the difference between nothing and something becomes fuzzy. I should mention here the Planck length (roughly 1.616252×10^{-35} metres), which in quantum mechanics is the smallest measurement of length with any meaningful interpretation. Apparently ‘any device that tries to beat the limit will be crushed into a black hole of its own making’. So how then can calculus include distances that tend to zero, other than by inferring lengths that are meaningless?

Paradoxically, calculus itself was used to calculate the value of the Planck length. Would it be mischievous to suggest here that many of the phenomena being observed/posited in particle physics, at the limits of observation, are actually the products of the point paradox, and not of observation?
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At the other end of the scale, there's cosmology, which is awash with competing theories of how the universe came into being, and what happened after that. "When a lot of different remedies are proposed for a disease, that means the disease can't be cured".

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Suffice it to say none of them actually work without tweaking the data. For example, there isn't enough observable matter in the universe to explain gravity, so cosmologists have had to invent 'dark energy' and 'dark matter', magical material that makes up a large proportion of the mass of the universe, but which they can't find. Cosmologists infer that it is there for their theories to work.

But it's one thing representing each problem as a series of equations; it's quite another to solve them. So we should ask just how well does this abstract construction called 'mathematics' actually function when solving equations? Not nearly as well as most people imagine. In the 1960s Roger Franks showed the difficulties in solving various types of equations.

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He constructed two three-by-three tables: the one on the left concerns linear equations, and on the right, non-linear. Apart from linear algebraic and ordinary differential equations, everything is either very difficult or impossible to solve by analytical methods.

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The more equations that are needed to model any particular problem, the more difficult it is to solve. Enter the number-crunching computer as a way out of this analytical dead-end, although now the devil will just appear elsewhere in the detail.

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As Picasso said: “Computers are useless, they only give you answers”. And we saw earlier, producing an answer using a mathematical method does not necessarily give you a solution.

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Worse, it turns out that computers actually solve less than was originally hoped. The butterfly effect always haunts the process. Will different choices of the resolution of data lead to different solutions? For no matter how elaborate, or sophisticated, or particularly subtle, a scientific description may appear, it always comes with paradoxes. These paradoxes are an unavoidable consequence of observation, as there is no escape from the fundamental distinction created with any process of observing.

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I find myself taking the Inquisition’s side against Galileo, and support the Church’s insistence that his theories weren’t the truth. If Galileo had been less dogmatic, and had signed a document stating that the sun was not at the centre of the solar system, then the Inquisition would possibly have let him off the hook.

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They wanted him to say that the heliocentric theory was only a model, useful for calculating, but that it was not the truth. How perverse that quantum physicists have more in common with the Inquisition than with Galileo.

We are back with Plato, who portrayed human interpretations of this world as a community living in a cave, observing flickering shadows from the real world of phenomena projected onto the cave wall. The big question is whether it is possible for an enlightened individual to go out of the cave into the sunshine, and see the marvel that is *reality* – other than as vain shadows, other than as imposed projections?

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My skeptical position is unequivocal: as individuals we are trapped inside a cave of private sensory experience, of delusions. Our heads are the cave, and the shadows are the projection of our senses. All we see are shadows on the wall of Plato's cave. We delude ourselves into believing that they are an exact emulation of what is happening outside. There is no going outside of consciousness and directly accessing reality.

For better or worse, we are trapped inside with these shadows bouncing self-referentially around the cave of our consciousness

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thrown out by the camp-fire of our cognition. Here we convince our intellect that this is reality, so we can adjust to the circumstances of our experiences.

Hence objective truth is a formal tautology; a ‘suitably falsified world’ of refined ignorance; a consistency within a system of self-reference. There is no true or false, no right or wrong way, only consistent and inconsistent interpretations of phenomena within the reflexive closure of systematic rules, which we humans lay down in our delusions, and by which we convince ourselves of the rationality of our position. All that matters is whether such interpretations are appropriate.

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For how can I know what I know, when ‘All that I know is that I know nothing.’

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For a more elaborate treatise of these arguments, you will just have to read the book.

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