

Trying to Understand the Universe

How the Universe is Becoming More Accessible

by [Christopher Ormell](#) (March 2026)



Starry Night (Jean-François Millet, 1850)

The Michelson-Morley experiment (1887) was a dreadful shock in cutting-edge physics. It showed that light was received by us in a way which was *relative to us*, and *not* relative to the objective cosmos! This seemed to defy any kind of rational explanation.

Fourteen years later (1901), Bertrand Russell discovered “his” contradiction. It was all about the set of all sets which were not members of themselves. This was, surely, the totality of all the *normal* sets, not the *peculiar* ones (i.e. those which happened to pass the test for being elements of themselves). But Russell also noticed that if this normal totality was self-referential, it would, by that token, *necessarily* have to be normal. At the same time an awkward, astonishing, contrary implication had also emerged: if it was normal, it would be *necessarily*—by definition—self-referential!

So this set of “all the normal sets” *necessarily* couldn’t be normal: but it couldn’t be self-referential either. These outcomes were locked-together as auto-contradictions: they were contradictions which seemed to be locked together by *logical necessity*.

At the time sets were reckoned to be at the heart of math.

So this was a horrible shock in math, one comparable to the earlier shock in physics. It, too, seemed to defy any kind of rational explanation.

So how could the gurus of physics and math face their lay academic colleagues, and explain that they were *completely unable to see any way to explain* these necessary shocks? It was a nightmare situation—one which seemed to be unavoidably saying that the brainiest thinkers on the planet had stumbled onto facts which they were totally unable to understand. Rationality seemed to have met its Waterloo.

Could good sense be an unattainable quest?

An exceptionally irrational, violent, brutal century followed. Ga-ga, spiritualism, seances, gangsters, hedonism, and fascism all began to flourish. Stupidity led to the sinking of *The SS Titanic*. Two years later WW1 began. It came with four years of industrial massacre—in the Somme, Ypres. etc —an unspeakable Apocalypse which seemed to signal the end of the world.

America came to the aid of Europe, and brought this enormous man-made catastrophe to an end. If it had gone on for another four years, it might have wiped civilisation off the map.

After the end of WW1 it was widely agreed that the two still unresolved "horribly impossible problems" needed to be accommodated in some unbiased way. So the demoralised opinion-leaders of that aftermath, decided that two "paper solutions" would be pushed to serve as "Official Stories." (If anyone asked "Why?" the answer would be "Because We, the Experts, Say So!") The physicists followed Albert Einstein (who proposed a fixed, static, timeless spacetime—about the least "relativistic" *absolutely*-absolute, timeless structure anyone could ever imagine). The mathematicians followed Zermelo and Fraenkel's set theory which declared that self-referential sets must be outlawed. This was a shameless resort to human intervention about what exists in maths, and what does not. The chief beauty of the concept of a set had been that its elements were determined by an objective, logical, explicit, "membership criterion." But now the leading gurus were intervening, and they were insisting on *not letting a set ever satisfy its own membership criterion!* This was disenlightenment. It was also flying in the face of reason, because it is obvious that "the set of all sets the mentioned in this essay" is a set mentioned in this essay.

It may be that the real intention behind these Official Stories was that the utter failure of the best brains on the planet was to be hushed-up. The two fudges were put forward, to give the *impression* that resolutions had been found when they hadn't. The grip of the elites turned out to be total. This meant that almost all their members felt that it was prudent to fall into line. Those who were aware of the fudging, were warned not to rock the boat. Wittgenstein and Ramsey *did* denounce the Zermelo-Fraenkel fudge, and they became victims of the attack dogs of the maths elite: their reputations were smeared. The leaders of both physics and math

were quietly admitting, in effect, that homo sapiens were, sadly, not “sapient” enough, ever to really understand the universe or the nature of math.

This was embarrassing because, ever since 1689, a flame of unstoppable enlightenment had been taken for granted.

Hushing the embarrassment-up, though, wasn't a clever move. It meant that the elites had inadvertently blown their former credibility. It was *admitting* that the best brains had failed, and had thrown-in the towel. These two problems were going to stay—according to the elites—for ever! At the time, Heidegger declared roundly that “The Enlightenment” had ended. So the fact that the elites had chosen to hush their failures-up, was, in itself, a signal that they were at their wits' end. It was interpreted, by those who saw-through the fudgery, as an admittance that the situation was worse than their leaders dare admit. The elites were sitting on dreadful news, which, if it became public knowledge, might demoralise ordinary, lay society.

Some populists saw their chance: they had been handed a wholly unexpected, undeserved, green light. Sub-standard education would be overlooked. Rules of all kinds would be ignored. Morality took a beating. Some male streetwise behaviour would display a vicious immaturity previously never formerly condoned. Civilisation had lost its final source of authority, and without the calming effect of this authority, formerly trusted practices were apt to disappear.

Today we can see how much damage has already been done. Serious philosophy is almost extinct. Optimism about the future has all-but dried up. “Genuine Leadership” in governance, politics, social practice, education and economics is nowhere to be seen.

Philosophy of a kind is still “being done” in academia, but it is in decline and it has become quite pathetic in quality.

Respect for “pure intellectuality” has almost disappeared. Where have the “Big Beasts” of philosophy gone? (Frank Furedi wrote a book which asked this question, but it fell on deaf ears.) There seem to be no successors with the reputation, discipline or standing which was achieved by Wittgenstein, Ayer, Ryle, Austin, Popper, Searle and Lakatos before and after WW2. There seems to have been a snuffing-out of any version of deep, realistic, science-based, civilised insight. Instead a jumped-up new activity called “knowledge engineering” emerged. It was/is a technical specialty concerned with converting various categories of early digital and analogue information into new digital modes.

It is not knowledge, as such, which can be “engineered,” but techniques used in expressing the factual element in knowledge.

This “knowledge engineering” was treated by the media as being initially useful and effective. It has led to things like character recognition, object recognition, facial recognition and AI. So this software “works”, after a fashion, and has been widely used. By comparison “philosophy” has become increasingly bitty, woolly, emotive, spaced-out, whingeing, and vague, almost entirely focused onto the remnants of “morality” –remnants which still remain after many “carts and horses” have pushed their way through Virtue’s broken hedges. As a consequence of this capitulation, “philosophy” has shrunk and almost disappeared. Epistemology has been all-but abandoned.

In 20th century, the French President Francois Mitterand used to call-in the leading French philosophers of his day to discuss fundamental policy options. No one expects anything like this to happen today.

The result: a serious loss of rigour, justice, sense and security in today’s disintegrating political, legal, educational, moral and international spheres. The average

person's "circle of awareness" seems to be gradually shrinking. It may already be "at" the minimum radius necessary, if urgently needed common-good reforms are to be adopted with a tide of effective personal support.

We are currently walking on a tightrope, which might be our last chance to create a firmly supported, just, commonsense culture in democratic, anglophone societies.

So let's go back to basics, and revisit the peculiar problem-field from which philosophy used to spring.

Philosophy used to stem from the fact that there are various obvious umbrella-truths like '*The universe must have begun somehow*' which seem to be inexplicable. What could possibly explain why the universe's first moment occurred? It appears that something must have been *already there* to prepare the structures of the seedling universe and to trigger their activity. In which case, this moment was not the true moment when the universe began.

If we are honest, we know almost nothing about the conditions and laws of physics which obtained 13 billion years ago. There is not the slightest trace of evidence that the laws of physics at that time were the same as today's. Some radical modern theologians admit that a common answer to this conundrum— "God" —is really just a "way of talking about" this extraordinary mystery. A realistic attitude would be that the past is an unknown country, which gets foggier and foggier the further we try to look back. In the end, these fainter and fainter glimpses turn into white-out. The difficult problem now becomes how the universe is being *sustained* here-and-now, day-by-day. What is the source of the wherewithal which is somehow keeping the laws of physics on the road?

Sometimes two adjacent umbrella-truths clash with each other, as when there is an umbrella-truth which tells us that we, as humans, have freewill, in spite of another umbrella-truth

which says that everything which happens in an individual's nervous system and brain is a consequence of the operation of biologic and bio-chemical iron laws.

Such problems represent the most difficult intellectual challenges we might be tempted to face. But no one seems to want to face them.

The verdict of the last 100 years is lukewarm: we have, in effect, given up trying to explain these massive contradictions: we have, in effect, thrown-in the towel of *determined rationality*, and we have lost any curiosity about any kind of credible scientific philosophy.

In a word, we have lost the unspoken, positive faith which our predecessors enjoyed: that we possess a potential capacity to gradually understand the limits of our condition and the opportunities which lie ahead.

How could such a total loss of cognitive hope arise?

Well, the dreadful effect of the killing fields on the Somme was to reduce any feeling of optimism in the 1920s. Hope of all kinds turned to ashes. Demoralised thinkers, who had survived the apocalypse, came up with corresponding demoralised conclusions. The attempt to maintain civilised culture all-but collapsed.

But today, let's remember, more than 100 years of water have gone under the bridge.

There is no excuse for such a defeatist mood today. We are much better equipped to deal with the baffling mysteries of philosophy, than the disillusioned, demoralised, washed-out savants of the 1920s. Wittgenstein took the trouble carefully to study and understand the way ordinary words have meaning. For more than 2,000 years philosophy had consisted of "footnotes on Plato." Math was the precise, wonderful, superior logos which ruled the roost: and it was recognised as

such by civic leaders. Plato's account of meaning was tacitly based on the towering, unquestioned reputation of math. Plato's credibility rested on bringing math and ordinary knowledge together, via their meaning, which was supposed to be the "naming of ideals" (e.g. points and lines had zero width. So the meaning of the word "cat" must, likewise, taken to be a paradigmatic "super-cat in the sky"!) Wittgenstein looked instead at how the meaning of words—as used by millions of speakers and writers every day—actually manifested itself. He soon realised that the notion that ordinary words had a quasi-math, quasi-religious implication, was barking mad.

Words, he argued, should have been seen as more like basic "tools," which offered alerted listeners to act on, or to look-out-for, named situations. This was a properly realistic account of meaning. "Don't ask for the meaning, ask for the use!" was Wittgenstein's famous saying.

Today this huge insight drives virtually all the verbal energy invested in professional news cycles, politics, drama, therapy, advertising, etc. The older Platonic notion of meaning as naming has been relegated to the dustbins of history. Perversely, though, Wittgenstein's great achievement, in sorting-out meaning, has had little effect on academic philosophers. Many turned away from Wittgenstein's conclusion, probably because the "Linguistic Analysis" notion of philosophy was being pushed by Wittgenstein's blinded followers far beyond its proper limits. Far too much "Linguistic Analysis" became boring, otiose, myopic and suffocating. Tom Stoppard guyed it mercilessly in his play *Jumpers*. The main problems of philosophy were being fundamentally misunderstood. They were essentially concerned with extraordinary language (cutting-edge science and religion), not with ordinary language.

Another serious distraction has been the gradual disappearance of strict, taken-for-granted standards in speaking and writing. Verbal sloppiness was defended as "authentic" usage.

Lots of people tried to make up for this fallen expectation by preceding some of their remarks with "to be honest." By contrast, Wittgenstein's account of meaning should be interpreted as applicable to verbal situations where an "honesty assumption" in speaking and writing obtained. This was still mostly being recognised as the norm in his day.

Turing and von Neumann, two mathematicians of the highest calibre, took the trouble to turn their dreams about possible computing machines, into working, general-purpose electronic gadgets. This was as fundamental an innovation as the discovery of the wheel. Suddenly math operations previously done by hand, could be done by machine, a thousand times faster, and, if necessary, a thousand times more complicated.. than had ever been previously contemplated. But there was a snag. The arrival of this new calculating power provoked anathema in the professional higher math community because it opened-up a thousand new *uses* for computation, thus contradicting the "math = a very superior intellectual artform" attitude which had long since been the assumption of their profession. The leading gurus of math saw themselves as deeply committed to lofty, abstract ideals which, in their view, would never justify having anything to do with messy, insignificant, grubby, get-rich-quick "everyday uses" of math. So a schism opened-up between the math gurus, who were determined to defend their "superior status" and those who saw a vista of new ways in which computers could help to solve puzzling scientific and public problems.

Crick and Watson took the trouble to study and understand the genetic mechanism which creates living organisms, DNA. They discovered the double helix using the newly available computer power. The genetic engineering which has flowed from this breakthrough, has created new medicines, vaccines and improved food yields... thus adding some shafts of optimism to an otherwise darkening outlook.

Bardeen, Brattain and Shockley took the trouble in the 1960s

to make electronic computers reliable, using semi-conductors. When turned into silicon chips, they could be operated at less than 10% of their potential, thus creating a level of quite unexpected super-trustworthiness. Before this breakthrough, the early computers kept breaking down. Afterwards they had the almost unbelievable reliability, which led to the possibility of the internet, smartphones, etc. The marvel of the internet as a cornucopia of important public knowledge, has given us an amazing modern advantage in exploring solutions to knotty problems. The fluent software which we now take for granted also adds much to the ease of modern writing. These wonderful innovations (as aids to thinking) were not available when news of the dismal problems broke in 1887, 1901, and 1919.

Charles Peirce, the famous 19th century American philosopher, took the trouble to study and understand what maths delivered for the human race. (No one had quite pinned this down.) He was the first major figure who saw, with great clarity, that *math was the creative discipline which studied the implications of large, promising hypotheses*. The pharaoh Khufu who built the Great Pyramid at Giza already knew, and had used, this awareness, 2,000 years before Plato was born.

However did Khufu manage to build such a massive mausoleum?

Let's consider the GDP of Ancient Egypt. By today's standards its economy was very, very poor. How could such an exceptionally poor country even *think about the possibility of building the largest imaginable human edifice*? How could Khufu even begin to persuade his circle of advisers that it was doable? The answer is that he already knew the power of math to illuminate huge projects like building pyramids. This project was only a "far-fetched hypothesis" when it was first broached. An agenda of pathfinding math would follow. It could be carried out, creating a huge archive of illuminative know-how. And what a mass of preliminary math delivered, served as a cast-iron confidence-builder—that it would *all fit together*.

So math was essentially serving as a confidence-building form of illumination. It had enormous applicability. It could be used to complete any large fully-defined material project.

Unfortunately Plato was not interested in building or practical projects. He knew that the Great Pyramid existed, but he evidently didn't bother to try to understand how it came about. More than 2,000 years later, though, Charles Peirce found that Plato's inward, blinkered, aesthetic interpretation of math was still the Official Story. He soon found, too, that his (Peirce's) landmark insight was being brushed aside. It was effectively buried by a majority of set-intoxicated gurus for about six decades, finally appearing in a widely read publication in 1956.

It came as a new insight, though, at just the right time.

After 1960, the super-charged, automated math of computers was a facility waiting for potential problems to analyse. Outer space was at the top of the list of things waiting to be explored, in all sorts of ways and forms. Lots of NASA teams needed to illuminate the implications of their particular hypotheses. These "hypotheses" were initial ideas about possible new rocket engines, vehicles, control mechanisms, destinations, etc. The answers, delivered by computerised math, told NASA whether these putative projects were viable. They included planning the necessary trajectories of space probes which were *actually done using Newtonian equations!*

Yes, the *credibility of Newtonian kinematics was roundly reclaimed*, contrary to the misleading headlines of 1919, which had shouted erroneously *Newton disproved!*

Seven good reasons have been explained above indicating that we now have new conceptual tools at hand with which finally to try to breakdown the awesome, allegedly "impossible" problems which had proved too hard for the feeble, disillusioned gurus of the 1920s.

How do these new tools make a difference?

(A) They make it clear at last that math is an active, creative tool, not something like a collection of exhibits in an elegant, abstruse, art museum. Math is—palpably—a human tool which has been used for thousands of years to try to understand the cosmos, as well as to streamline economic activity.

(B) They counter the “idealisation” tendency that the gurus of math adopted in the Ancient World to give their profession gravitas and to show-off its charmingly elegant patterns. (The fact was that the Emperors, Kings, Warlords, etc. of Antiquity held math in great esteem. But the gurus who spent their lives sitting in front of abacuses—concentrating on their beads—needed a way-of-talking which implied that their discipline had a wider credibility. Plato gave them this, by linking its mystique to aesthetics and religion.)

(C) The arrival of computers has, at last, made-up for the 2,500 year failure of math’s brainiest gurus to recognise the illuminative value of their logos. (It had all been there to see, but somehow the gurus failed to see it.) There are now many examples of brilliant analyses, like DNA, encryption-systems, and bringing the astronauts back from the Moon using only a few litres of fuel. These triumphs are “out there.” Their presence firmly cements Peirce’s insight, giving it, at last, undisputable credibility.

(D) Wittgenstein never quite managed to apply his account of meaning satisfactorily to math. (He may have been undermined too much by the attack-dogs of the aggressive math elite.) Platonic math obviously didn’t have enough “uses” to fit the bill; it wasn’t claiming to have a “use.” But Wittgenstein’s landmark analysis of how ordinary language works immediately provokes the question: “What is the unobvious use of math?” Meaning, we now know, stems from humanly-valued “uses.” So what is math’s most humanly valued use? Its most profound use

is... *illuminating promising theories about the universe and creating the determination and confidence needed to bring commongood projects to fruition.*

(E) Could we do better? Why not use our creativity to reify abstract objects out of randomness, thus creating a new illuminative discipline which will inevitably throw light onto transient reality, i.e living, sentient animals and the human beings which are part of our world? In this way the human world can be conceptualised as a self-reifying system.

So the gist of the message is that humankind was twice ambushed, first in 1887 and then in 1901, by two incredibly difficult scientific dilemmas (Michelson-Morley's and Russell's contradictions). The boffins who tried to explain them had only timeless, paralysed tools to hand. Later the demoralised gurus of the 1920s succumbed to issuing fudges. This departure from rationality subliminally disillusioned them—and eventually the disillusion slowly spread, eventually to involve most ordinary intelligent people. But today, a 100+ years later, we have acquired seven new conceptual tools which we can use to try to restore positive rationality and reasoning.

The essence of the new approach is that it injects a fundamental *dynamism* into abstract thinking, associated, as it was, with timelessness. Abstract thinking need no longer be stultified by idolising infinitely static timelessness. This is what the discovery of super-paradoxes shows. (Interpreting a paradox takes time, and during this short time the implications can switch.) This is what the discovery of anti-math shows. Randomness can only occur in an environment full of unexpected, lively, dynamic, "change": in a timeless world, there can't be even the slightest trace of randomness.

Have these new tools have done the job? Yes! They have

successfully given birth to anti-math, the natural counterpart to an increasingly oppressive, intimidating, foggy, overloaded math. Aristotle was already well aware—in the Golden Age of Greece—that searching for timeless reality was only part of the story.

Since the beginning of civilisation, math has been used to try to model the universe in an outline way. It has done quite a good job: but today the inherent limitations of such “rigid outline modelling” have started to appear. This has now built-up to a crisis of chronic stultification and misunderstanding. There are now thousands of basic questions like how the laws of physics are enforced, why space is three dimensional, and why velocities cannot exceed the speed of light, which today’s physicists have tacitly abandoned. The last two, incidentally, can already be explained using anti-math.

So the good news is: that early signs of a new dawn have arrived!

Anti-math modelling promises to open-up a much better understanding of transient, biological reality, as opposed to the rigid, “wooden”, timeless, reality, which is the best that math modelling can do. (Descartes famously showed how math could be used to study movement. But his method only applied to *predictable movement*.) It involves learning to *imagine* the changing scene wrought by changes in a symbolic configuration as the variable t increases. So it also requires *consciousness*, or more specifically, human imagination: something quite outside of the conceptual vocabulary of math. The requirement that imagination needs to be brought to bear on... stochastic diversity, as well as deterministic formulae, still applies.

It is now clear that the only credible reality we experience in our ordinary lives is “transient reality” Non-transient, granite-like states-of-affairs, on the other hand, can never be verified (as lasting for ever), because that would involve

living for ever. Our quest is now to find a special sub-structure of transient wavelike elements, and modelling them using anti-math methods. It might take a hundred years to complete this new agenda, but it will be an endeavour full of positivity, full of hope.

Much research will be needed accurately to represent the emergence of organisms and eventually sentient, thinking beings (=humans). Thinking beings are necessary to reify anti-math, and there is every likelihood that we shall find that anti-math modelling can, in the end, throw up amazing cybernetic, neural entities (systems) which we call "human brains" So we now have an outline explanation about why we are here, and why the universe is here. Against all the odds, a fascinating, cheery, liveable future beckons.

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Christopher Ormell is an older philosopher of mathematics who solved Russell's Contradiction in 1959. The solution was published in *Mind*, and was noticed with approval by Karl Popper, but otherwise ignored. Later he found a mirror image of Descartes' classic *Cogito* argument which he launched in a six-article series in the journal *Cogito* (1992-4, also ignored. It was a proof that absolute unpredictability was logically possible but mathematically impossible.) He discovered superparadoxes, which generate vast numbers of contradictions (put online in 2003). He earlier found the first formula for the n th prime number without using trigonometric functions. (*Math Gazette* 1967). He discovered explicit formulas for calculating $[x]$ and $|x|$. He later spent 29 years searching for an elementary solution to Fermat's last theorem. This putative reasoning has now been on-line for more than five years. (A prize was offered for its refutation, but

so far, no flaw has been found.) His main work, though, has been discovering a wholly unsuspected, spectacular, polar-opposite to math ... Anti-Math, which quite unexpectedly brings methods, similar to those of math, to bear on the logical implications of transient forms. These forms are imposed—by willpower—securely onto random sequences. The result: Anti-Math enables the brilliant, civilised, moral thinking of Kant to re-occupy centre-stage. We are beings who manage to secure our own existence by unconsciously applying life-affirming definitions to a wholly independent, unexplainable, neutral-random substratum. Websites: philosophyforrenewingreason.com, and mathsforrenewingreason.com.

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