

**NEXT
LEVEL
CLIMATE
THINKING
AND
ACTION**

CLIMATE
ACADEMY

Chapter Nine
Paradigm Shifts

Draft Version: Jan 2022

Copyright © Matthew Pye

A few preliminary words...

Perhaps surprisingly for a short textbook on climate change, this chapter is not actually going to talk about climate change. At all.

As the title suggests, it will examine paradigms.

The most helpful first step would likely be to offer a couple of definitions:

A paradigm

“A paradigm is a theory or a group of ideas about how something should be done, made, or thought about”.

Britannica Dictionary

“A paradigm is a set of assumptions, concepts, values, and practices that constitutes a way of viewing reality for the community that shares them, especially in an intellectual discipline”.

The Free Dictionary

It is rich word. It deserves our full attention for a whole chapter.

Well, to be honest, the chapter will spin around to look at climate change directly at the very end. Yet, in the absence of explicit references, there will be numerous implicit implications for our situation with climate change all the way through.

Readers are challenged to annotate the text, or make notes somewhere else, where they can identify parallels or implications for climate change. This change of approach makes the chapter a bit more of a game – a type of thinking that is important for our predicament.

Indeed, if climate change were a problem that could be resolved in a fact-fight, then it would be rather simple to fix. This textbook would be much simpler to write. It would just list the key data, and perhaps show a few graphs - decisive action on climate change is such a no-brainer. Anyone with a bit of common sense and remote interest in living on a habitable planet would immediately see the importance of radical change.

Unfortunately, this is not a fact-fight.

And so, although we must be armed with the clearest view possible of the scientific truth, we must have a creative and strategic mind when we think and act.

Onwards then, without any references to climate change, other than those that arise in your head and heart.

Introduction

On People and Planets

Case study One: People

I was 19, she was 18. It was long high school romance. I was at university; she was completing her A-Levels. It was Spring. There was a burst of cherry blossom on campus, and a burst of anticipation as I boarded the train. I was going back home to Manchester, to meet Kate for the weekend.

Despite the distance between us, all the vital signs were good. We had been together for over two years. There had been a steady exchange of calls and letters, full of affirmation and affection, consideration and care; and most recently, an impossibly oversized card for Valentine's Day had not fitted into my mailbox.

However, when we met, she was not herself. There was no spring in her step, and no bounce in the conversation. Perhaps she was not well? Or maybe it was the fatigue of a day's work in the coffee shop? We went for our traditional evening walk around the local lakes near her house.

We were half-way through the walk when Kate said, "I think we should stop".

Fortunately, there was a bench close-by. I gestured towards it in sympathy, she was obviously not feeling 100%. "No, I think we should stop", she insisted, as we sat down together. "It's fine", I said reassuringly, "we can rest here as long as you need".

"No, really, I think we should stop". There was an extra twinge of angst in her voice. It was clear that she really wasn't feeling well. I acknowledged her wish to go back home, but cautiously pointed out that it was the same distance home to complete the walk as it was to turn back the way we came.

"No, you don't understand what I am saying", she said with bulging frustration. Choked by the emotion, and her brain fused out by the significance of the moment, Kate was struggling to find different words for what she wanted to say. Tears came.

My brain jumped into a much higher gear, suddenly exploring alternative meanings. The words and the tears together would indeed make a lot of sense if she was ending the relationship. However, such an idea was so profoundly shocking and alien to me, my mind grabbed another conclusion. "Oh, you are pretending to dump me", I chuckled - Kate was brilliant at many things at school, including drama.

This desperate misinterpretation only made things worse of course. And thus in the last moments of our romance, I was confronted with the deeply uncomfortable choice of either facing reality, or really admiring her acting skills, as her shoulders shuddered in weeping misery. It should not have taken prolonged sobbing for me to have understood her simple sentence, but it did. The simple truth is that I really did think we were good.

From *that* bench, we walked in opposite directions around the lake. A few minutes later found me sitting like a zombie in my car, and it took a few weeks to shake off a sense of the unreal.

Under pressure

We all carry around in our head a certain constellation of beliefs.

We use this set of beliefs to interpret the events around us. This frame of understanding enables us to put things in perspective; it helps us explain why certain things have happened, and why others didn't. It also provides us with a map with which to move forward into the world.

However, these belief and ways of life can come under pressure. All world views must cope with experiences that stretch their understanding of reality. In unusual circumstances, sudden and unexpected shocks can be really confusing and painful to deal with. Accommodating such events into a belief system is a tough thing to do.

A resilient background set of beliefs is normally a good thing. We all need a stable storyline to make sense of what is going on around us. A relationship is usually one of the biggest stars in our constellation of meaning. My belief that I had a happy and long future together with Kate was a major plotline in the story I was in; it gave shape to my future, either measured in years, weeks or days. I admit that I was embarrassingly slow to understand what Kate was trying to tell me. Not only had she affirmed our relationship in countless moments before, but the whole thing just made so much sense it really was difficult to understand what was happening at that bench.

My bad. Yet, imagine the opposite psychological problem. It would be impossible to live with somebody who had an extremely fragile scaffolding of beliefs for his or her life. Imagine how implausible it would be to partner someone for whom one forgotten Valentine's card, or one burp at the dinner table, would invalidate a whole relationship; or one phrase said in anger would be a definitive signal to walk out.

Indeed, in love, it is the overcoming of glitches, the ability to see beyond a fault or a mistake that makes things work. It is the willingness to reconcile and repair that gives a relationship its deeper strength. The craft of mending is where some of the deepest stitches are made. The restoration of a common space between two people brings with it a stronger unity.

More generally, life will often throw a whole lot of junk at all of us. It is healthy and important to have a framework to understand it all. Indeed, the resilience of our background beliefs about life is an essential feature of human societies. Either as individuals, or a culture, we need a sense of the narrative line that joins up the main dots of our experience.

We are not just a 2-dimensional PacMan, mindlessly going "gobble, gobble, gobble" from one sensation to the next. We all live inside a matrix of beliefs. We could call this matrix "the symbolic order"¹ or more simply, our "story of the world"². We can't live without this framework, even if such a lot of it is invisible or subconscious.

Questions

- When have you not seen an obvious truth in front of you? When have you had an idea fixed in your head that only became a clear mistake after far too much time?
- What sort of psychological barriers are there to seeing the truth?

¹ This is concept of the psychoanalyst, Jacques Lacan. It is a useful piece of vocabulary even without explaining or subscribing to the deeper meanings that he embedded in the term.

² A term from the public speaker and author, Charles Eisenstein.

- Are there people in your life, or people you have directly observed, who have shown deep resilience?

Case Study Two

Planets

The value of holding onto your beliefs, even under heavy pressure, is evident in personal relationships. Its value can also be seen in the history of science.

This second case study starts in the 17th century with Sir Isaac Newton - one of the most celebrated scientists in history.

Newton provided a radically new and effective framework to understand the physical world with, but it got tested. What is informative here is that the testing of his theory ended with his work being emphatically endorsed.

It makes sense to start in 1687, with the publication of one of the most extraordinary, arguably *the* most extraordinary work of Physics, Newton's "*Principia*".³ It laid bare the mechanical laws and forces that governed the movements of all the bodies in the universe - everything from falling apples to orbiting planets, and from the flow of tides to the trajectory of comets. Newtonian Physics had huge explanatory power – all made possible with just a few simple principles and some clear-minded mathematics⁴.

After the publication of "*Principia*", it really was playtime for Physics. Newton's laws were tested, explored, applied and extended in countless areas of research. That fun continues today. In 2006, a group of Physicists set up an experiment inside a box, the size of a can of coke. D.J. Kapner and his team (who were normal sized people, stood outside of the box) and set up two small spinning metal discs just 56 μm apart⁵. They were testing the gravitational pull between the discs, and they found that Newton's laws were still valid even at such miniscule distances⁶.

Having this strong frame of reference for scientific exploration was fundamentally important for so many advances in technology – indeed, even centuries after Newton's work, it was "*Principia*" that provided the basic textbook for the NASA scientists who put three blesks into a metal box and catapulted them towards the Moon in 1969.

Yet, there was a little pocket of time in our scientific history when things were not working out so well for Newtonian Physics. Whilst it was true that Newton had eradicated any lingering doubts about whether the Sun was in the middle of the Solar System, whilst it was true that his theory had explained the orbits of the planets and the procession of the equinoxes, there was a little glitch. Actually it was quite a big glitch – it was a problem the size of a planet: Uranus.

³ Published in Latin, the full title was, "*Philosophiæ Naturalis Principia Mathematica*".

⁴ Namely, 'Calculus' – a entirely new mathematical system that he (or Leibniz, if you prefer that kind of biscuit) invented.

⁵ 56 μm could also be written as 0.0056cm.

⁶ « *Tests of the Gravitational Inverse-Square Law below the Dark-Energy Length Scale* », January 2007, [Physical Review Letters](#) 98(2):021101.

Uranus (careful how you pronounce it) had been displaying irregular movements. The observations of Uranus repeatedly and stubbornly refused to fit the predictions of Newtonian mechanics. Recordings and calculations were checked again and again, but the numbers just did not add up. The odd results were a big problem, because Newton's laws were universal. They could not fade, wobble or distort just because something was a very long way away; they could not be right everywhere else in the universe, but just not correct with Uranus.

What to do then? There was not really any choice. Astronomers had to double down on the Physics, they had to be resolute. Despite all the data, they defiantly held on to Newton's laws and predications... and by stubbornly insisting that Newton was right, a wonderful new discovery was made.

The glitches in the data could be resolved if the astronomers postulated another planet, further out in the Solar System; a planet that could be interfering with Uranus' orbital pathway. And that is precisely what Urbain Le Verrier did in 1846. With this abstract addition to the Solar System, the quickening and the drag observed in Uranus could be understood, as it moved in and out of that gravitational field of this new hypothetical planet. The location, size and speed of this abstract thing could reconcile all the glitches in the observational data of Uranus.

On receiving the papers of Le Verrier's cosmic calculations, it only took the German astronomer Galle a few hours to set up a telescope in the right direction. And so, on 23rd September 1846, just before midnight, this actual new object was observed for the first time within 1° of its predicted position.

We call this large object: Neptune.

It was a dramatic moment in the history of science. The scientists were rewarded for their patience. Like a relationship that overcomes its difficulties, the fundamental beliefs were powerfully affirmed.

- When have you doubted yourself, but then seen your strengths come through?
 - What do you think your main strengths are?
 - What aspects of your character or skills do you still wonder about?
- The Ancient Greeks thought that our greatest strengths are also our weaknesses, do you agree?
- What tough tests lie ahead or behind you?
- What other revolutions happened in Physics, either before or after Newton?
 - When these revolutions happened, did they completely destroy the former system of belief?

MAIN TEXT

On Paradigm shifts

When to move on?

After these two contrasting case studies, an important set of questions now presents itself.

In the case of Kate, it was important to give up a belief.

In the case of Newton, it was important to hold onto it.

So, at what point should we allow a relationship to fail? When should we pull the plug on a pattern of behaviour? How long should we try and protect a world view? When does it become unhealthy to carry on inside an old system of thinking?

The truth is that it is very difficult to know. Without a divine view of things, we must make our judgements based on the evidence at hand. Knowing when to make a break with a belief or a commitment is problematic. Moreover, once it is clear that it is time to move on, it can then be difficult to *actually* move on.

The dynamics of messy personal relationships are worth a little more attention, because it will expose a key feature of how complex systems of belief operate: we turn again to tipping points. In the case of complex systems of belief, a tipping point is the moment when one paradigm of beliefs collapses, and a space opens up for a new one to emerge.

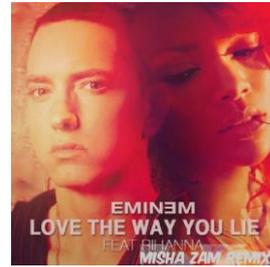
This the first appearance of the word “paradigm” in this chapter – and it signals the direction that we are going in.

Getting stuck

Most clearly, in the case of an abusive relationship it is evident from an outsider’s standpoint that we should just get out. Yet, the tragedy is that the dynamics of power in such a situation normally stall that crucial decision for far too long.

What should count as an alarm signal for emotional, physical or sexual abuse is most often converted or suppressed by the victim to *not* count.

"I Love The Way You Lie"



Eminem

"Now I know we said things, did things that we didn't mean
Then we fall back into the same patterns
Same routine, but your temper's just as bad as mine is
You're the same as me, when it comes to love, you're just as blinded

All I know is I love you too much to walk away though
Come inside, pick up your bags off the sidewalk
Don't you hear sincerity in my voice when I talk?
Told you this is my fault, look me in the eyeball
Next time I'm pissed, I'll aim my fist at the drywall

Next time? There won't be no next time
I apologize, even though I know it's lies
I'm tired of the games, I just want her back, I know I'm a liar
If she ever tries to fucking leave again
I'm a tie her to the bed and set this house on fire

Rhianna:

"Just gonna stand there and watch me burn?
Well, that's alright, because I like the way it hurts
Just gonna stand there and hear me cry?
Well, that's alright, because I love the way you lie
I love the way you lie
I love the way you lie".

Like a blackhole, which grows in size and pulling power with every star it swallows up, this kind of warping of our personal reality is truly difficult to move decisively out of. In dysfunctional relationships, the centre of gravity is too heavy and too strong to enable the person trapped in that space to act autonomously. All the lines of meaning involved in that relationship tend to bend in towards the problem, and it takes real courage and outside help to get up, over and out of it.

Indeed, even without the damage that might be inflicted by someone else, we can get into negative feedback loops of meaning on our own. In periods of doubt, isolation or depression, it can be hard to allow the clear voice of love or praise a place in the orbits of our thoughts. Every gesture or action,

even if it is true or well intentioned, can be flipped by a confused or conflicted heart to appear as false, as an attack or as a negation.⁷

The End Game

Getting entrenched into a false view of the world, others or ourselves, is all too easy. We are all prone to getting the frame for our experiences skewed badly.

It is not just distorted or dysfunctional world views that we become attached to. Perhaps more predictably, we are also prone to getting entrenched in world views that work; sometimes, in fact, to world views that work *extremely* well. Such a situation might not be a problem at all. However, in both unhealthy or healthy worldviews, problems and inconveniences get masked.

Any errors, losses or unresolved problems in a system can be ignored or bypassed because the other strengths in play protect it from further scrutiny and stress. It is as if a dominant worldview has an immune system that blocks any alien ideas from getting through into the central operating unit that “tells the story”.

Any build-up of failings can, of course, be benign. If, however, these dysfunctional features of a system are serious enough, and if they are kept out of sight and reckoning for too long, they will eventually reach a critical mass.

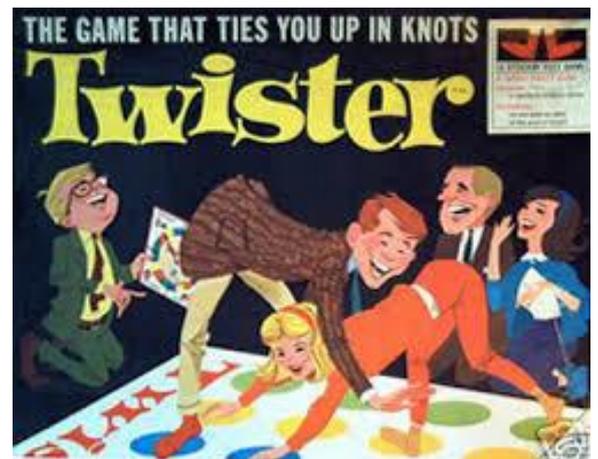
Or in other words, a tipping point.

In such a moment, the breakdown of that system is sudden and dramatic.

A feature of systems dynamics is that there is a clear contrast between the slow growth that occurs when a system is functioning successfully, and the rapid collapse that happens after a tipping point has been crossed.

The final moments of the party game ‘Twister’ offer a helpful metaphor for those last moments. After a slow build-up of different positions with an increasing level of entanglement, “Left Foot on Red”, is declared after the arrow stops spinning. Everyone on the dotted mat, and everyone observing, knows that this move is simply impossible.

As the hapless leg extends towards the red dot, the ball of human spaghetti enters into its final moments of strain... then it transforms into something more like Lasagna.



Relationships can so easily get knotted and stretched. In the end, the only possible release is a collapse. “I was only five minutes late!” she protested. “I just forgot to lock the door”, he yelled.

⁷ See “*Nietzsche Tackles Climate Change*”, for a fuller exploration of the details about the psychology of truth and power.

Simple mistakes, forgivable mistakes, but not if they push things over a stable threshold. Tipping points are a typical feature of any complex system. Relationships certainly are complex – but perhaps surprisingly, we can find tipping points occurring in the minds and commitments of a community of people who are well known for their reasonableness, their sensible and methodical approach to things: Scientists.

Scientific Revolutions

Science fully deserves its reputation for reliable knowledge. It has robust methods and exacting standards that test any truth claim made under its name. It is built on a firm foundation of evidence and reasoning. No time need be spent in categorical defence of their methods and results.

Yet, an attentive look at how the history of science has moved forward reveals a messier story. The rather bumpy road of scientific history, mirrors many of the dynamics of human and social relationships that have just been identified. It has disagreements, knotted problems, and tipping points where the consensus of belief suddenly shifts.

This unpredictable story does not invalidate the conclusions that scientists have arrived at, but that non-linear history has some valuable lessons for anyone who invests a little time to look at it more closely.

Our expert guide in this area will be the American Philosopher of Science, Thomas Kuhn.

Thomas Kuhn



The publication of Kuhn's work, "The Structure of Scientific Revolutions" (1962), caused a radical rethink in how we understand the development of science. His groundbreaking work challenged our common sense understanding of things – namely, that the story of our scientific past is one of a smooth, linear progression. Kuhn exposed how erratic, and sometimes irrational, the development of scientific awareness is.

He describes the history of science characterised by two different types of activity, periods of "Normal Science" and periods of "Revolutionary Science". He noted how science has long periods of settled research that are punctuated by sudden spasms and convulsions in which fundamental

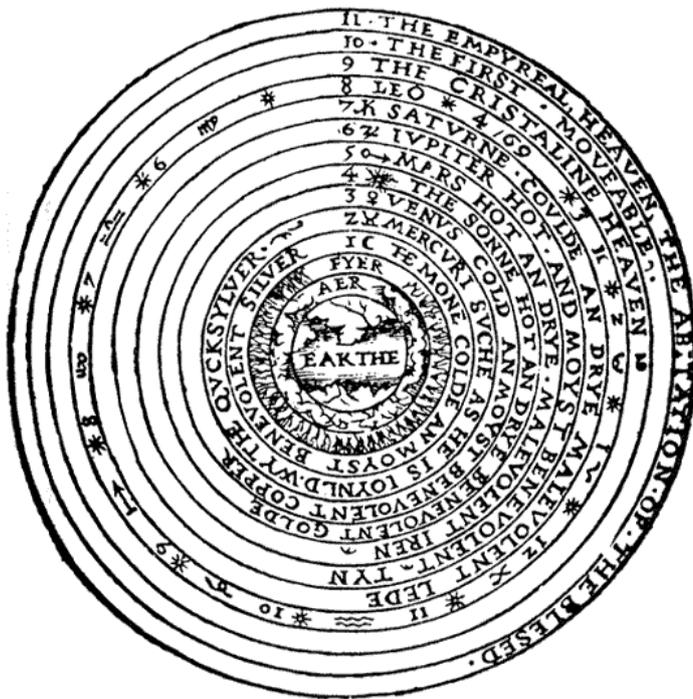
assumptions are overturned.

These spasmodic moments of crisis, of short bursts of "Revolutionary Science", can happen because the pressure of evidence or the number of glitches with the old system just becomes too great. An old paradigm of understanding can dramatically buckle under the weight of results and anomalies that just cannot be reconciled to fit the background assumptions⁸.

⁸ Scientific revolutions can also occur from a sudden shock to the system without a build-up of pressure. For example, the astonishing genius of Albert Einstein caused a profound convulsion in Physics with the four papers he published in 1905. Seemingly out of nowhere, with the most audacious act of imagination, he utterly reimagined the nature of time and space. A shift into "Revolutionary Science" mode could also be triggered by a deeply unusual observation that abruptly cracks previously held assumptions. For example, the OPERA experiment in 2011 seemed to record a neutrino travelling faster than the speed of light. If true, this would

The Copernican Revolution is an informative example of Kuhn's main conclusions.

The sudden flip to Copernicus' model of a *Solar System* happened long after the publication of his work "*On the Revolutions of the Heavenly Spheres*" in 1543. His model was mathematically compelling; so many of the numbers added up, and it made so much sense of the night sky. Unfortunately, however, the old way of seeing the universe (with the Earth in the middle) was too deeply entrenched for his model to be taken seriously.



Indeed, by contrast, the old model was taken so seriously that in 1600 Giordano Bruno was hung naked upside down at Campo di Fiori in central Rome, because amongst his heretical views was an endorsement of the radical Copernican view of the cosmos⁹. Hanging him upside down was just his warm up act - to being burnt alive at the stake.

Astronomers of that time had inherited a model of the universe from Aristotle and Ptolemy that had the Earth at the centre of everything. This model made a huge amount of intuitive sense. You are probably seated perfectly still right now reading these words. The trees outside are not bending backwards under the stress of monstrously powerful winds, and it is not that difficult to walk in a straight line. Wherever you are holding these pages, things probably seem quite settled and stable.

Yet, if Copernicus' new model was correct, and if Galileo's observations were to be taken seriously, you must agree to the rather implausible idea that the Earth is hurtling at 100,000kmh through space, and spinning on its axis at over 1000kmh.¹⁰ It goes without saying that we are still travelling on that crazy ride, every year, every day. A moment of reflection reveals this fact to be almost impossible to reconcile with any common sense.

Or as the Great Inquisition put it to Galileo, "Why is every day not a bad hair day?"

Back in the 17th century, there were many social, political and psychological reasons to keep hold of the old belief system, but the singular most important reason for the inertia for change was arguably the overwhelming weight of common sense in favour of the old Aristotelean model.

have knee-capped Einstein's "Special Relativity", a fundamental component of modern physics. In the end, it wasn't a true result, and Physicists were strangely deeply relieved and disappointed at the same time.

⁹ It is a matter of historical dispute what the main cause of his condemnation was. Bruno held many unorthodox views that he was unwilling to recant at his Inquisition, including pantheism and reincarnation.

¹⁰ The Earth spins at 1670kmh at the Equator, and orbits the Sun at 107,000kmh.

But “the truth will out”, as Shakespeare would soon pen.¹¹ The main problem with the Aristotelean model is that it was wrong. It just didn’t make that much sense of the movement of the celestial bodies. By the time Galileo got his telescope out in 1609 to observe the night sky, the whole system was under serious stress. To keep the Earth in the middle, scientists had got themselves into the most amazingly contorted positions with the data. They had continuously added “epicycles” (extra loops and gears) to the traditional orbital model.

It was a situation not unlike a juggler struggling to keep his act going, as numerous random objects are thrown in his direction, with the expectation that he incorporates them into his flow.

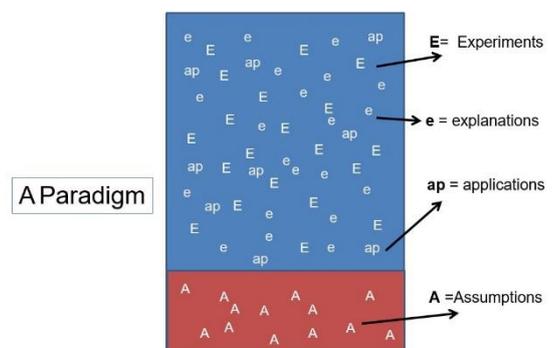
Galileo’s observations were the final straw that caused the old model to buckle. Despite the seemingly absurd implications of the heliocentric model proposed by Copernicus, and despite the initial resistance, the scientific consensus towards that new model became unstoppable.

A new, previously unimaginable reality, abruptly, suddenly became true.

Paradigm Shift

The diagram opposite is a simple sketch of what Kuhn understood as a paradigm.

As noted earlier, the history of science is full of dramatic lurches, from one paradigm to another. These short revolutionary episodes of science are marked by intensely creative shifts in understanding. In these shocks of turbulence, fundamental assumptions about reality are thrown into doubt (shown in the diagram in red).



Once these shocks of turbulence are over, and a new set of assumptions are established, Kuhn describes how science then settles down into “Normal Science”. In these long periods, researchers test out the new rules of engagement, tidy up the mess and explore new possibilities.

In the diagram, this calmer, methodical mapping of the new world is represented by the blue area. It is a field that is defined by the key assumptions of the paradigm. In a period of “Normal Science” the assumptions are not up for grab; they are not negotiable at all. The foundational assumptions of a paradigm frame the basic operating space; they dictate what is a relevant question to ask, and forbid certain results. (For example, modern Physics forbids anything to go faster than the speed of light¹².) The base assumptions also determine funding decisions and orientate the curiosity and imagination of the scientists into further areas of research.

It is crucial to understand that a paradigm shift is not just a simple editing of content. For example, in the case of the Galileo controversy, the change in paradigm was not just about where to put the Earth in a diagram. The confirmation of the new model had monumental implications throughout

¹¹ Spoken by Lancelot Gobbo, “*Merchant of Venice*”, Act 2 Scene 2, 69-74. (Written a few decades after the Galilean Affair, it is a scene not without some direct relevance to that controversy, because Lancelot is mocking his blind old dad).

¹² In a modern democratic society, the fundamental assumptions that frame everything else are principles like ‘the rule of law’; in a relationship a basic background assumption would be, ‘we are in this together’.

both science and society at a deeply structural and symbolic level. The Copernican Revolution was so deep, it overturned many fundamental assumptions.

There were many big headlines about the carnage caused by the new paradigm. To mention a few:

- it demoted the Earth from the centre of meaning, to just some random rock in space;
- it put a wrecking ball through the authority of the church to pronounce on scientific conclusions;
- it was perceived to undermine scripture;
- it shook up the old Aristotelean view that the material world was heading towards some kind of purpose (τέλος, *telos*).¹³

These were all seismic movements in our cultural history.

Interestingly, a reader will not find these headlines to be very dramatic at all. We might have to Google the word “Telos”. We might get a thrill from looking out at the stars at night in recognition of the seemingly infinite expanse of space. Maybe there is dark thrill in recognising our unanchored position in it all. The Bible may have only the faintest cultural relevance to you.

But this gap underlines the crucial point: we live in an entirely new paradigm, a few revolutions further on from this Galilean controversy. It requires a lot of reading and imagination to put ourselves back into the social, political, scientific context of that time. It is like another world.

It is like trying to understand a foreign language – it is not just the words that matter, there is a whole game involved. Every word performs in a cultural context that is alien to us. Anybody who has tried to do translation work understands how difficult it is to move authentically between languages. Anybody who is bilingual will be aware that certain experiences and feelings from one of their native cultures simply cannot be captured in their other native language.

Kuhn has a word for this lack of translatability in science. It is not a word that would make it into many pop songs. It is the clunky word, “Incommensurability”. Or if we break the word into pieces, “a lack of a common measure”. Kuhn understands that if you were to line up the different paradigms that have occurred in the history of Physics, they simply would not be able to talk to each other. This lack of communication would not be a problem of accents. It would be a problem due to entirely different systems of thought. A paradigm shift is not like tinkering with some vocabulary of a language, it necessarily involves an overhaul of the entire grammar.

Einstein’s Physics broke some fundamental principles of Newtonian Physics, which in turn were violated by Quantum Physics. These differences could never be reconciled, each paradigm of Physics is simply incomprehensible to the other. It is not that one paradigm is better than another, just as Japanese is not better or worse than Italian or Finnish. Each scientific paradigm provides us with access to a different layer of reality, just as each language of the world opens up a fresh world of symbols and angles on experience for us to live with.

Indeed, the word “paradigm”, after the pioneering work of Kuhn, has been used and developed in fields much wider than scientific knowledge. Most notably, the fruity philosophy of Foucault was committed to exposing how what seems “normal” to a society is in fact the product of different power interests. His work will be mobilised in Chapter 11. It is just interesting to note here that Foucault’s use of “paradigms”, like Kuhn, undertakes a historical survey of the past to better

¹³ For a fuller analysis see, “*Descartes Tackles Climate Change*”.

illuminate the present. His analysis of our current value systems, and the limits of what we can imagine, and dream is both audacious and powerful.

Conclusions

And now we swing around to look at the climate crisis.

Why all this attention to abstract frames and ideas? What value do these concepts and words have with the immediate, material problem of the climate?

It is undeniably true that, in one sense, these truths are very remote. It is hard to imagine what relevance a dead American Philosopher called Kuhn has got for your life. It is a bit of a stretch to see why Galileo, from the far distant past, has got anything compelling to tell us about the present. Yet, by considering paradigms, it brings to the surface of our minds something powerful. The odd thing is that we live most intimately with the reality of our paradigms. Arguably, they are the *most* real thing we live with.

A paradigm is the like the DNA of our thinking, it is the invisible stitching that pulls together all the different experiences that we have. We own it in such a deep way, it is difficult to see it. A paradigm shapes our dreams and ambitions, it sets up our expectations. Our paradigms fix what we feel as naturally good, they form our spontaneous reactions to experiences. We carry around these constellations of beliefs in our hearts and minds, and just like astrological charts are understood by some to fix the course of lives behind the scenes, these paradigms are invisible to our daytime thinking but they determine our reactions and decision making.

No-one is exempt from them. We don't just "have experiences", as unattached, singular, blobs of data. We are not just blinking goldfish.¹⁴

We will not wake up thinking about the publication date of Kuhn's book. Nor will we become preoccupied by the stress endured by Galileo during his Inquisition. But these people and their work can point to the frameworks that exist inside our own heads. And by learning to see those frameworks, we can understand the contents of our hearts and minds so much better.

A perceptive and skillful psychologist can help us see patterns in our behaviour and thinking that would otherwise be hidden. A language teacher brings to the surface the rules of grammar that we have used since our earliest years but had no clue nor care about.

Indeed, we are all born into a set of values and expectations, like we are all born into a language. We learn to talk and play in that language well before we ever understand the invisible governing principles of how it all works. An understanding of that grammar provides us with the capacity to learn and then function in another system of language – with all the extra agility and depth that this provides.

Just having the word, "paradigm" in our vocabulary helps us reflect on ourselves and our world with more probity. Thinking about paradigms enables us to see things that are, paradoxically, too close to see.

¹⁴ This is neither a bit of slang, nor a well-researched biological statement.

The Matrix (1999)



[Morpheus](#): Let me tell you why you're here. You're here because you know something. What you know you can't explain, but you feel it. You've felt it your entire life, that there's something wrong with the world. You don't know what it is, but it's there, like a splinter in your mind, driving you mad. It is this feeling that has brought you to me. Do you know what I'm talking about?

[Neo](#): The Matrix.

[Morpheus](#): Do you want to know what it is?

[Neo](#): Yes.

[Morpheus](#): The Matrix is everywhere. It is all around us. Even now, in this very room. You can see it when you look out your window or when you turn on your television. You can feel it when you go to work... when you go to church... when you pay your taxes. It is the world that has been pulled over your eyes to blind you from the truth.

[Neo](#): What truth?

[Morpheus](#): That you are a slave, Neo. Like everyone else you were born into bondage. Into a prison that you cannot taste or see or touch. A prison for your mind.

The Flickering

It is lonely, being fully engaged in climate activism.

You live like an alien in a paradigm of values and ambitions which make little sense to you. Your attempts to articulate both your aspirations and anxieties often seem doomed to fail. When you speak about the dangers of systemic collapse, somehow people do not have the imagination to understand what you are saying. When you speak about the riches of an economy for the common good it often leads to blank looks. Your vision of the future is dismissed as unrealistic, when at the same time those who are satisfied with a tinkering of the *status quo* don't realise how profoundly unrealistic the current reality is.

There are so many people around you who "Don't Look Up". You live in the same world as everyone else, yet the whole thing is somehow, oddly, skewed. It is incomprehensible why decisive action is not taken to protect us from an existential threat. There is something Kafkaesque about the lethargy and zombie like reactions of public figures, media coverage and, worst of all, sometimes those who are close to you.

The good news is that a time of radical change is ahead. The good news is that you are not alone.

This textbook is not going to naïvely and bluntly assert that a miracle is around the corner, but there is a flickering that is happening with increasing intensity. Both a flickering output of the old paradigm and a flickering light that provides glimpses of what the new paradigm will look like.

The dark truth is that natural tipping points might push us into a new paradigm chaotically. The laws of thermodynamics written into the fabric of the universe might take us over the threshold of unstoppable transformation first. However, the bright truth is that there are also tipping points in social systems too. We build up to them slowly, but once they lock into a shift towards a new paradigm, the energy and momentum are unstoppable. And to return one last time to the Copernican Revolution, it might seem a bit unnecessary to say it, but the reason why the Physics of Copernicus and Galileo became standard was because it was the truth. It was as simple as that.

What could be simpler today than recognising the physical limits of our Earth? It should be blindingly obvious from any photograph taken of the planet from outer space. It has a circumference. What could be plainer than the truth that the Earth's biosphere cannot tolerate a 'hyperpyrexia' of 4°C heating? Anyone with the memory of a fever should have no problem imagining the suffering and failures such a knackered state would cause.

Those who understand the sort of paradigm shift that must happen, those who "get it", can afford to be confident and courageous - because the recklessness of the *status quo* and the advantages to be gained by a transformation to a sustainable society are so obvious. Once the truth about the crisis has been seen in its systemic fullness, it cannot be unseen. Future generations will look with incredulity at the stalling ignorance that held us back from the systemic changes required.

More. The transformation of societies into ones that are compatible with the laws of physics and chemistry will have to be far more beautiful, healthier, collaborative, and just.

What is not to like?

For the moment, these realities seem part of a distant world. Yet because they are rooted in our truest selves, once there is a movement towards such rewarding advantages, it is hard to imagine that that momentum could possibly be reversed.

The transition to such a world could already be underway; the flickering signals are becoming more pronounced – from the impulses of the FFF movement to the stronger policy signals and asset flows towards greener energy.

The paradigm has not yet flipped, and so the most prominent people in the climate movement still appear out of key - like time- travellers or futuristic entrepreneurs; like prophets, or like philosophers. But every paradigm move has always started like this – it is how things work.

Spasms, then surge. Convulsions, then calm consensus.

The flickering, then the flame.

As Schopenhauer is often quoted as saying, “All truth passes through three phases. First it is ridiculed, then it is violently opposed, and finally it is accepted as common sense”.