

SPECIAL ISSUE 41 APR 16 JIM SCHOFIELD



# SHAPE JOURNAL

THE SECRET DEATH OF CHAOS

MASTERS OF ANOTHER WORLD / WHERE IS THEIR WORLD? / FORMAL CHAOS  
MARXISM, PHILOSOPHY AND MATHEMATICAL CHAOS: NOTES ON MORLEY'S REVIEW





## The Secret Death of Chaos

Special Issue 41 / April 2016

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of *The Secret Life of Chaos*



# The Secret Death of Chaos

## introduction



Welcome to the 41st Special Issue of the SHAPE Journal entitled *The Secret Death of Chaos*. This edition is a strange sort of double review. A review of a TV programme on mathematical chaos from 2010, and a review of a “Marxist” review of it!

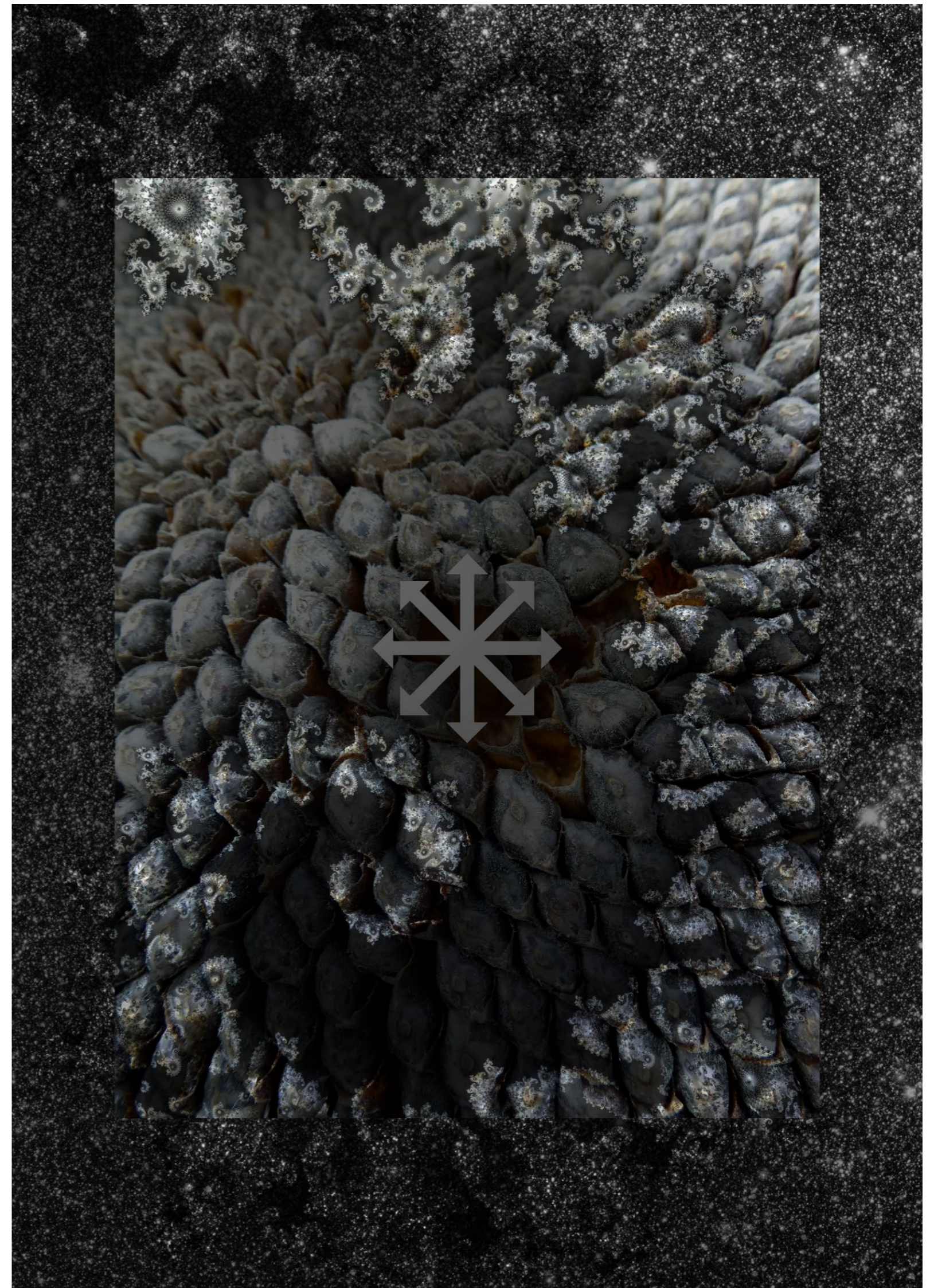
Having recently come across Daniel Morley’s review of the BBC TV documentary *The Secret Life of Chaos*, and finding that his critique (he is a avowed Marxist) was dramatically opposed to my own (also Marxist) series of review papers on the very same TV Programme, I considered criticising his contribution, but realised that a better service to those interested in such things, would simply be to re-issue both together, for readers to make their own decisions as to what was correct.

I commenced by writing a review of his review, but soon realised that readers would be better informed by seeing not only Daniel Morley’s contribution, but mine also. Access to the original programme would be essential too of course: it can be found here: [The Secret Life of Chaos](#).

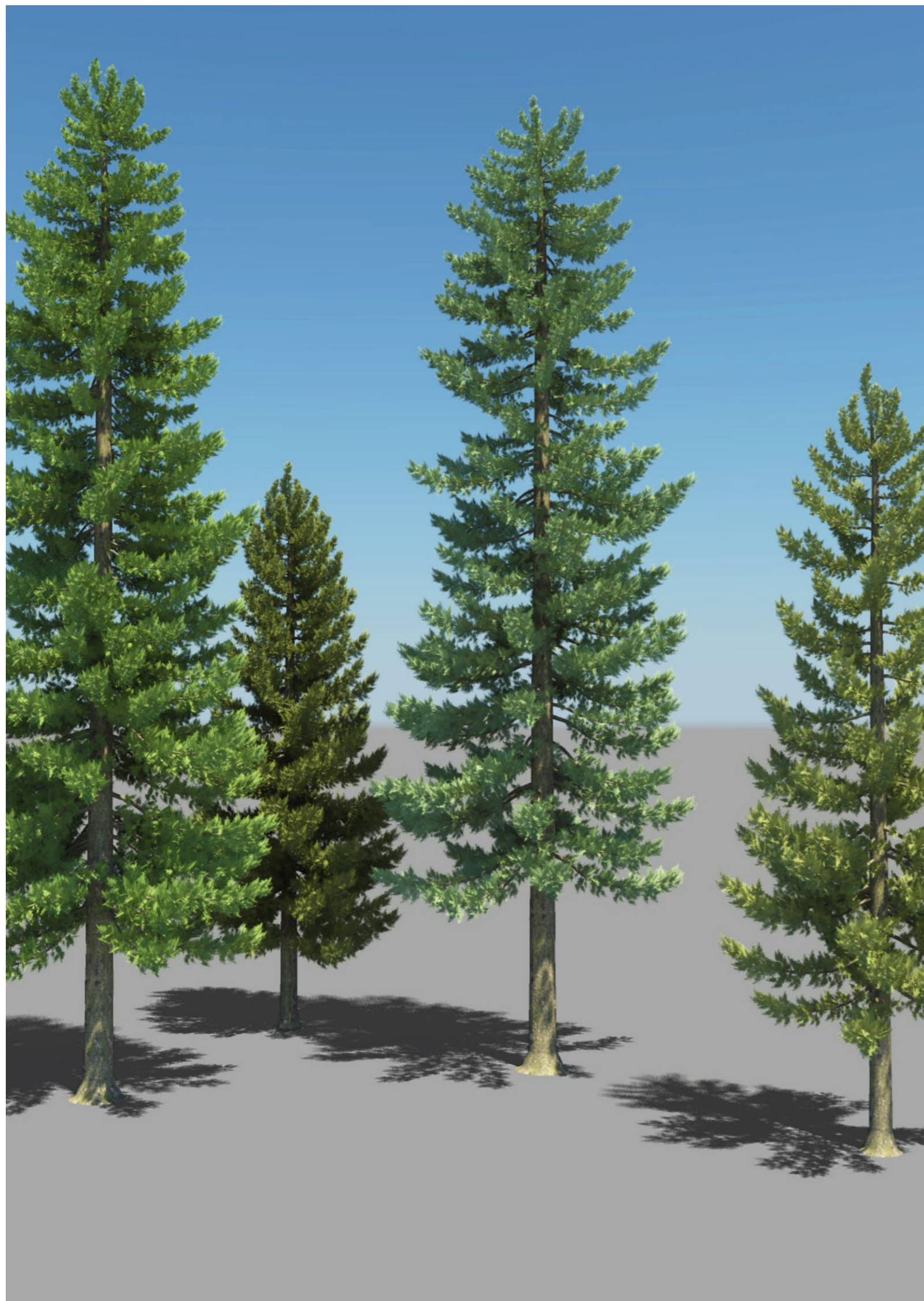
I was, to say the least annoyed at Morley’s review, but soon came to the conclusion that a Marxist versus Marxist head-to-head would be nowhere near as useful as a presentation of everything under discussion. So contained in this Special Issue of the SHAPE Journal there will be:-

This Introduction  
Masters of Another World  
Where is Their World?  
Formal Chaos  
What is The Secret Life of Chaos?  
Links to the original programme and Morley’s review  
Notes on Daniel Morley’s review

**Jim Schofield**  
April 2016







## Review: Masters of Another World

### *The Secret Life of Chaos* BBC4 13/01/10 9pm

It had, of course, to happen!

I had been expecting it for some time, and, finally, the leading group of Physics TV presenters have all come together to weave an all-embracing view of Reality with a seemingly single voice. The retreat from Science to Technology, and from Explanation to Formulae & Pragmatism, had to extend beyond its Physics (and close relatives) base, and begin to be put forward as even the cause of Life itself!

Twenty-five years ago when working in one of the Glasgow Universities, I was assisting the excellent mathematician, Jagan Gomatam, who was working from the experimental evidence on oscillating chemical reactions in liquids, in order to investigate the Forms of the involved Reaction Fronts. Though he was a mathematician, he was working with a chemist and myself, a computer scientist, to attempt to encapsulate what was quite clearly going on there into the mathematical definition of the complex form that was involved.

His co-operation with us was unique. He knew that the primary causes of this phenomenon were indeed *chemical*, and he also knew that what he was doing was deriving a purely formal model that would help the investigation to progress.

Of course, Jagan was not a scientist, but a mathematician, so he also was keen to address new forms that, as with all other forms, would be applicable in a variety of concrete phenomena, and his job was to deliver the most general, and adaptable universal form, evident in the studied area.

As mathematics was the study of Form alone, it was clear that his final formulae would not explain the phenomena, but could deliver the best tools for scientists to use in their studies. But, we could never forget the concrete factors involved and concentrate solely on the Mathematics.

Now, it may intrigue the reader why this brief account was included here, but the presenters were addressing Chaos, and studies of liquid reactions were always mixed thoroughly to ensure a kind of “chaotic” or ransom mix – the exact opposite of what Gomatam et al were insisting upon in their studies,

But, such attitudes to Science and Mathematics were not universal among many in both camps. “Why not?”, was their usual reaction to the above assertion about concentrating ONLY of the formal aspects. “Surely, what we are seeing, in these isolated, extracted and abstracted forms, are the primary driving laws of Reality: they are the essences that make things what they are?”, was their assertion.

Just as today’s sub-atomic physicists no longer ask the question, “Why?”, and even condemn it as a metaphysical prejudice, and instead ONLY concern themselves with the extracted formulae, a similar retreat is now happening throughout Science with Mathematical Chaos as the latest excuse.

Indeed, the new strain of “chaotic” scientists is even more pernicious than the Copenhagen School in Sub-Atomic Physics, because, as this TV programme confirmed, they don’t even deliver Prediction!

It is argued that even simple equations can deliver situations in which we cannot predict, for we cannot know the essential initial conditions, and without the Prediction is impossible.

This retreat is total, but the way that it is sold in the TV programme is as a Great Advance!

But, if we cannot explain, and we cannot even predict, what does this new Science actually deliver?



It gives us *unpredictable* forms, which we can install into our computer programs, and watch the impossible-to-predict things unfolding before us in all their diversity and beauty.

It is more of an Entertainment than either Science or Technology, and, in addition, these believers of the New Science can be shown to lie in their teeth. The “simple” equations are not, repeat not, simple.

The Mandelbrot Set’s equation is written as:

$$z \leftrightarrow z^2 + c$$

but you may well ask, “What is  $\leftrightarrow$  ?”

Well, having done this sort of stuff over 25 years ago in another project with Jagan Gomatam, I can tell you!

It is not a normal deterministic equation: it is an iterative equation, more normally written as:

$$z_{n+1} = z_n^2 + c$$

and what it means is that a new (n+1)th value of z can be obtained by substituting in the previous (n)th value of z into the right hand side of the equation. The two z’s are from different iterations. They cannot both exist at the same time. And, you will have noticed that to use the form you have to have a starting value of z.

NOTE: Also, did no-one notice that all the images of the Mandelbrot Set were Two Dimensional? How did they get them from the given equation? They could do it because z is a complex number, where  $z = a + ib$ , where a is the real part of the number and i is the square root of -1.  $ib$  is termed the imaginary part (with b as another real number). By plotting a against b we can get a 2D graph. But, why did they not explain this? Might the **square root of -1** be considered a give away, and lead to the non-mathematical viewers coming to dismissive conclusions?

Now, these chaotic phenomena, which the programme seemed to make general are actually both

1. Special, and
2. Iterative.

Indeed, they are not about numbers at all, but Operators – that is how we get the square root of -1 – for it is actually the Operator “turn anticlockwise through 90 degrees”.

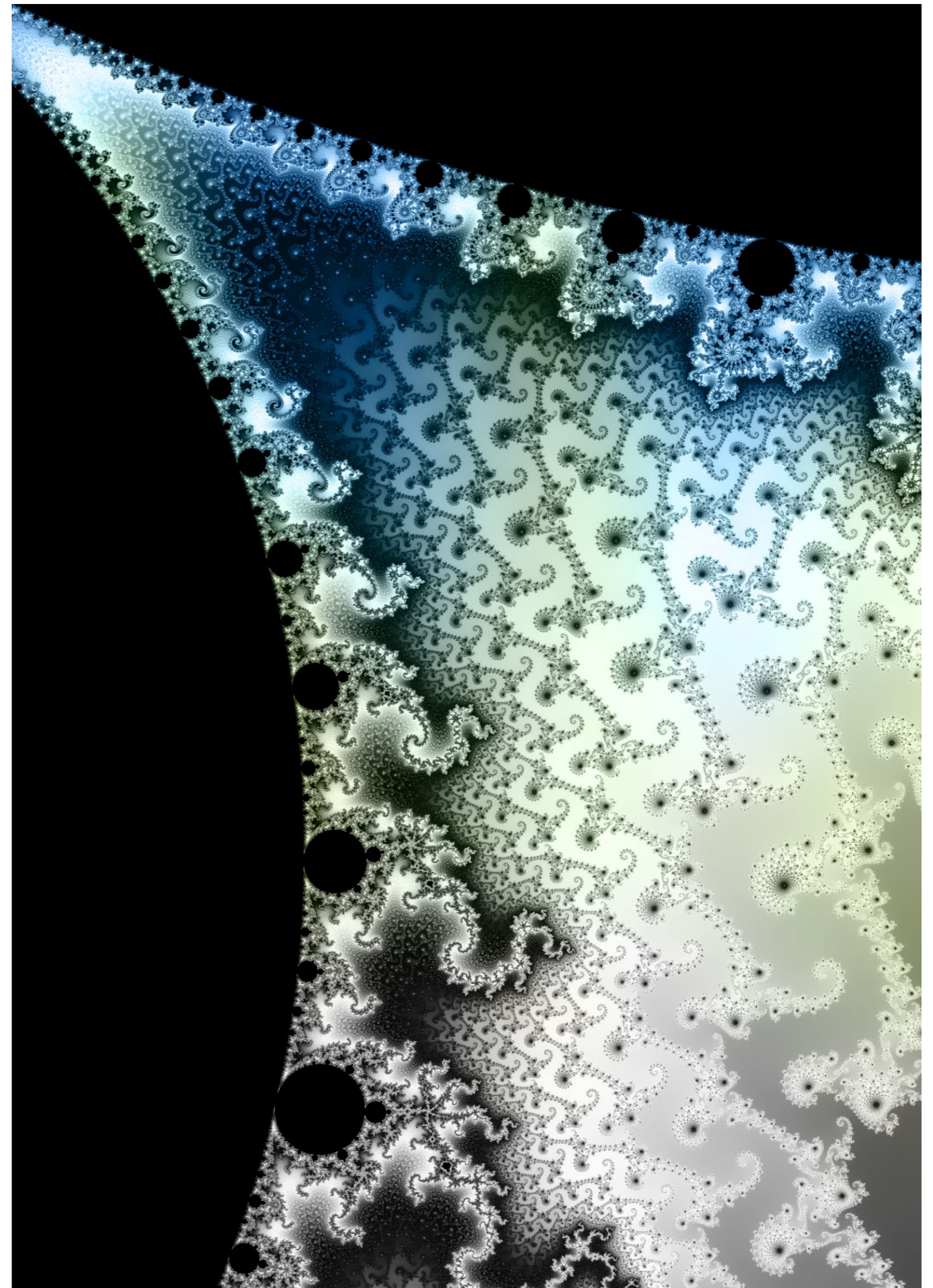
They were found, by Lorentz and others, in equations, which included derivatives (rates of change), and the uncertainty has always been true for this type, as rates of change cannot deliver direct variables without both Integration and Initial Conditions. Do you remember them mentioning unknowable Initial Conditions in the programme? I do!

I have, for many years, been criticising “TV scientists” like Kaku, Al’Khalili and Stewart for their unprincipled fantasising about Reality, as a cover for the inadequacies of their methodologies.

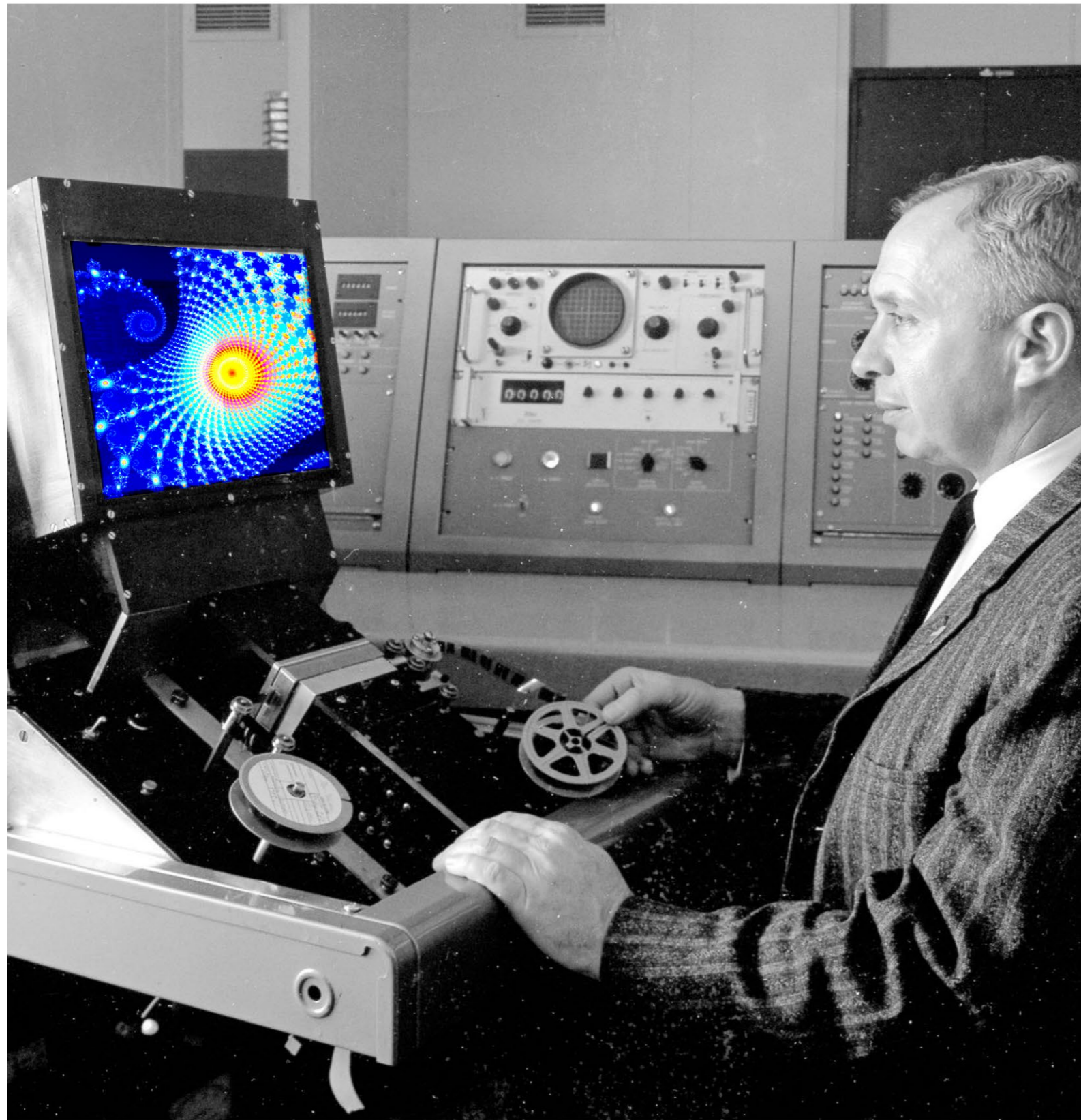
A year or two ago, I also wrote a rather long critique of a book by two Indian mathematicians, in which they (as a fictional story) told of a mathematical “hero”, who proposed mathematical-type “truth” as the ground for everyday life. It was, of course, total rubbish! But the stupidity of it was clear for all to see. These “mathematicians”, however, illegitimately use their involvement in Science to attempt to put the stamp of scientific legitimacy upon their false definition of the future of Science in general.

Instead of the wide road towards Truth, they are promoting to Essence-status formal relations, with false myths of Elegance and Form, which cannot produce real phenomena, do not explain anything, and now can’t even predict.

Such “scientists” should not even be allowed to pedal such rubbish in prestigious Institutions of Higher Education. They are total frauds!







## Where is Their World?

*The Secret Life of Chaos* BBC4 13/01/10 9pm

The TV programme *The Secret Life of Chaos* proffered a “simple” equation, which it then demonstrated could produce “infinite complexity”. It was clear that these presenters were showing to the World what they considered was the longed-for, hidden jewel of **determinism**.

The key inference (projected to an obviously non-mathematical and non-scientific audience) was that the generally agreed assumption that Reality was totally generated from essential laws had been proved!

Instead of the usual mechanistic results from the usual conceptions of determinism, here, at last, was revealed a veritable deep richness of outcomes, so intricate and unpredictable, that it was even overtly claimed that it would (in time) explain both the Emergence of Life, and even that of Consciousness!

But, this proffered “revolution” merely added more weight to the major retreat from Explanation and Understanding that had been gaining ground in Science for a very long time.

And, it is NO revolution!

It is merely another brick in the wall, which supporters of this philosophical position have been using to “wall-in” Reality – tidying it away from the *real* World, and into the tidy Universal World of Pure Form alone, which is their chosen and comfortable home.

In spite of their “excitement” and “conviction”, it was impossible to see any profound insights or explanatory gains that they were so joyously celebrating.

NOTE: They reminded me of a fellow teacher of mine, who used to come out of his latest lesson rejoicing in his triumphant success, only to be immediately followed by a gaggle of totally perplexed students.

Indeed, their position repeated the trajectory of all such programmes of recent years, in “selling” the mathematical determinism of Reality, but very surprisingly without showing any actual Mathematics! NO detailed maths was revealed – only the products of such maths.

The audience was evidently considered too “untrained” to be able to cope with the actual Mathematics (very difficult and esoteric stuff, you see), so instead they were bombarded – not, as you would expect, with proofs or evidence, but with assertions, assumptions and wild speculations. The reason I can be so condemnatory is not only that I too am a mathematician, but even more important I am also a scientist (with a degree in Physics), and their arguments simply do NOT wash!

The crucial revelation was when Jim Al’Khalili was dealing with Benoit Mandelbrot’s famous Fractal Set, in which, by clever computer graphics, could be quickly and easily inferred to be an infinite (yes, infinite!) journey into Forms generated by

$$z \leftrightarrow z^2 + c$$

The same sorts of patterns (with minor differences) were repeatedly revealed, and we were informed that these occurred in branching plants and even natural coastlines. No, they do not!

Or at least, any similarities were not due to the causing action of such a form, but things that were much more concrete.



Such infinitely recurring patterns NEVER occur in Reality. What they actually mean is that something clearly “looking like” these fractals can occur in Reality, but that is NOT the same thing at all! They may well be able to synthesise a deterministic tree or coastline, for use in animations, but they are not the same as Reality, by any measure of means.

For, if one was to do the same recurring “looks” at various levels in any piece of Reality, the Form would very soon cease to be appropriate as the forces that deliver the Form would be left behind, and quite different Forms would immediately be evident.

Implicit in their assertion is the belief that what produces the constantly recurring Forms, are eternal, driving laws, which underlie and even cause these features in Reality. But, once again, they certainly do not! There is no evidence that they do so. They are only true in the World of Pure Form alone - in Ideality!

The rubbish about endlessly repeating forms in Reality is nonsense. So, what were their purposes? What were they so eagerly demonstrating?

It was clearly the actually endlessly repeating forms that occur, not in Reality-as-is, but in Mathematics! And that is very different because it is NOT Reality. It is a World containing absolutely nothing concrete – only Pure Form alone, the elements of which were first discovered within Reality, and which after millennia of failures in both their extraction and use, were finally isolated, extracted and abstracted into totally Pure Forms – Equations.

Now, this crucial process not only forced us to always use these new methods when dealing with Reality (methods involving rigid controls and maintenance of Domains expressly designed to enable their use). BUT, all of these purified extractions constituted a Collection, which purposely left Reality behind. ALL concrete determinations were purposely omitted in order to arrive at an abstracted and pure Form and nothing else. Equations are pure abstractions dealing only with Form, and generalising them for multiple use wherever they “fit”.

Now, this was NOT purposively, or even unavoidably, detrimental! Because they had been wholly abstracted, they could be legitimately investigated within their own rich and yet idealised World. It should surprise nobody

that the obvious name for this World should be Ideality, though we all know it as Mathematics!

But, there was another side too. There was also a completely idealist outcome when these people made the assumption that these abstracted relations actually *made* the concrete World what it is.

Disembodied, purely formal relations were taken as driving concrete Reality. Such conceptions are not new, of course, for Mankind has mostly believed in a non-material God who drives Reality in a different way. Though different, both these ideas are entirely idealist! What else are they?

But, how do our mathematical scientists get away with it? The World of Pure Form deals only in abstractions from Reality, which have been totally stripped of any concrete elements whatsoever. These are its only substance, and, as was demonstrated 2,500 years ago in Ancient Greece, once these extractions had been achieved they could be organised into coherent systems. Euclidian Geometry is by no means the Truth about Reality, but it did, and still does, constitute a body of coherent relations, which can be organised into theorems and their unquestionable Proofs.

Once again, I can speak about such things from a position of great familiarity - I was always very good at such proofs. In my youth, I was always very annoyed if I ever got a score below 100% in Mathematics. So, I am not a critic from the outside, but an expert in such fields. Now, if that completed my C.V. that would not be enough. Indeed, those more than competent at such things are most likely to promote them to being the central features across the whole spectrum of phenomena. There is a major problem with being ONLY a mathematician! Confirmation bias!

I could go on with this identification and study of Ideality, but I know that it would not be sufficient to demolish these denizens of mathematical Science.

Remember, though they claim to be *revolutionaries*, they are in fact extremely conformist practitioners in their field of expertise. Indeed, their position has actually become the general consensus. Almost nobody disagrees. There may be quite energetic arguments about this theory or another, but on their basic philosophical position, they are all the same.

You might think that such a fact might give a great deal of credence to their standpoint, but it doesn't! The limitation of peer review! All of their colleagues have also chosen to study ONLY this quite separate World of Pure Form, and all their discoveries are valid ONLY within that World. But, surely, however coherent that World has become (and both Gödel and Turing greatly disagreed that mathematics could even be that), it still has to be confirmed by the ONLY final arbiter – Reality itself!

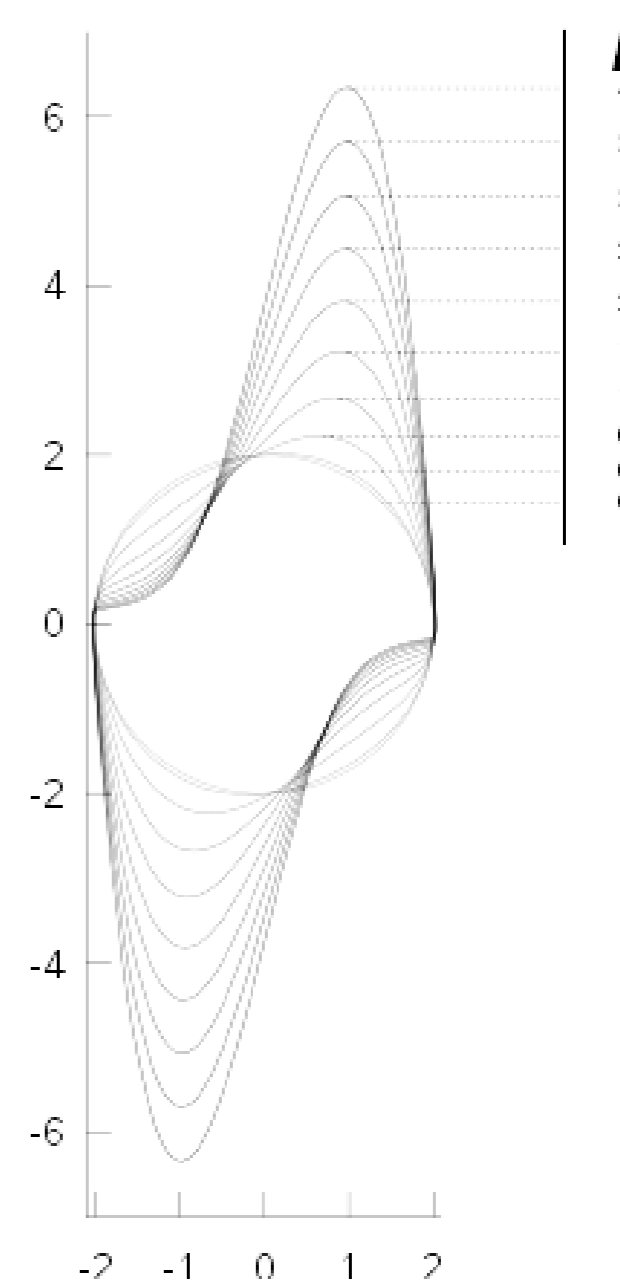
And if it is NOT so confirmed, it certainly must lose all credibility as the underlying Essence – the driver – of Reality!

It, as with many other restricted disciplines, becomes a *brilliant fiction*, and when such constructs are then imposed upon Reality, we must condemn them, and reveal their quite prodigious shortcomings.

Now, this short paper can only begin the task of opposing such false philosophies. But, as this is a many-sided issue, I must go on to reveal other areas in the position revealed by this TV programme. Perhaps the most important is the area of Iterative Equations.

Once again, I can talk about this area, because I spent a good part of the 1980's researching these very areas along with mathematician Jagan Gomatam.

He was devising various mathematical models for reaction-fronts in liquids, and in the modelling of the Human Heart based on Van der Pol's famous equations, so, as the programmer of all these investigations, I simply had to see exactly what was involved, AND what questions did not get answered when I asked them.





## Formal Chaos the thieving saviour of mathematics?

This seems like a question that has been answered fully long ago, and slotted into a maths-led world-view to bridge many gaps, and “explain” all sorts of so-called “randomness”. But, we must remember that Mathematics is NOT, and never can be, primary!

In spite of the language used by mathematical scientists, who regularly imply that it is, as well as insisting that formal equations actually “drive” Reality, and make it what it is. We must, instead, insist that Form is in fact itself wholly determined by concrete Reality, and NOT the other way round!

As soon as we do this, the phenomenon of Chaos ceases to be the magic ingredient in Reality purported to be “explaining” so many things, but is, instead, a formal “aberration” caused by something concrete in real world phenomena, properties of matter.

To use “chaos” as a primary cause, is obviously circular reasoning. Reality itself must have the propensity to display both “pedestrian” stability and chaotic instability, and these will come to the fore in different concrete circumstances. The universal assumption of stability has to be dropped, and the real trajectory of development substituted for that major simplification.

NOTE: The implications and consequences, of the usual inversion, are demonstrated perfectly by the almost joyful grasping at Chaos as the “cause” of the recent World Financial Crisis (2008). So, instead of addressing the really existing causes, it becomes *Fate* – an unchangeable feature of Reality as it is (often encapsulated in the advice, “Give up now you’ll never do it!”) Once again, I must stress that such language must be rubbish!

How can any abstract, disembodied relation drive concrete Reality? How could such a thing ever occur? Where do such non-concrete forces come from, and exactly how do they act upon Matter?

Clearly, such an inversion is nonsense!

If, on the other hand, we obviously, and correctly, take Reality as primary, with all its properties and laws being produced by the evolving nature of that wholly concrete sources, then no idealistic nonsense is necessary.

We may not yet understand Reality in all its phases and processes, but we cannot falsely source its qualities solely in our own abstractions.

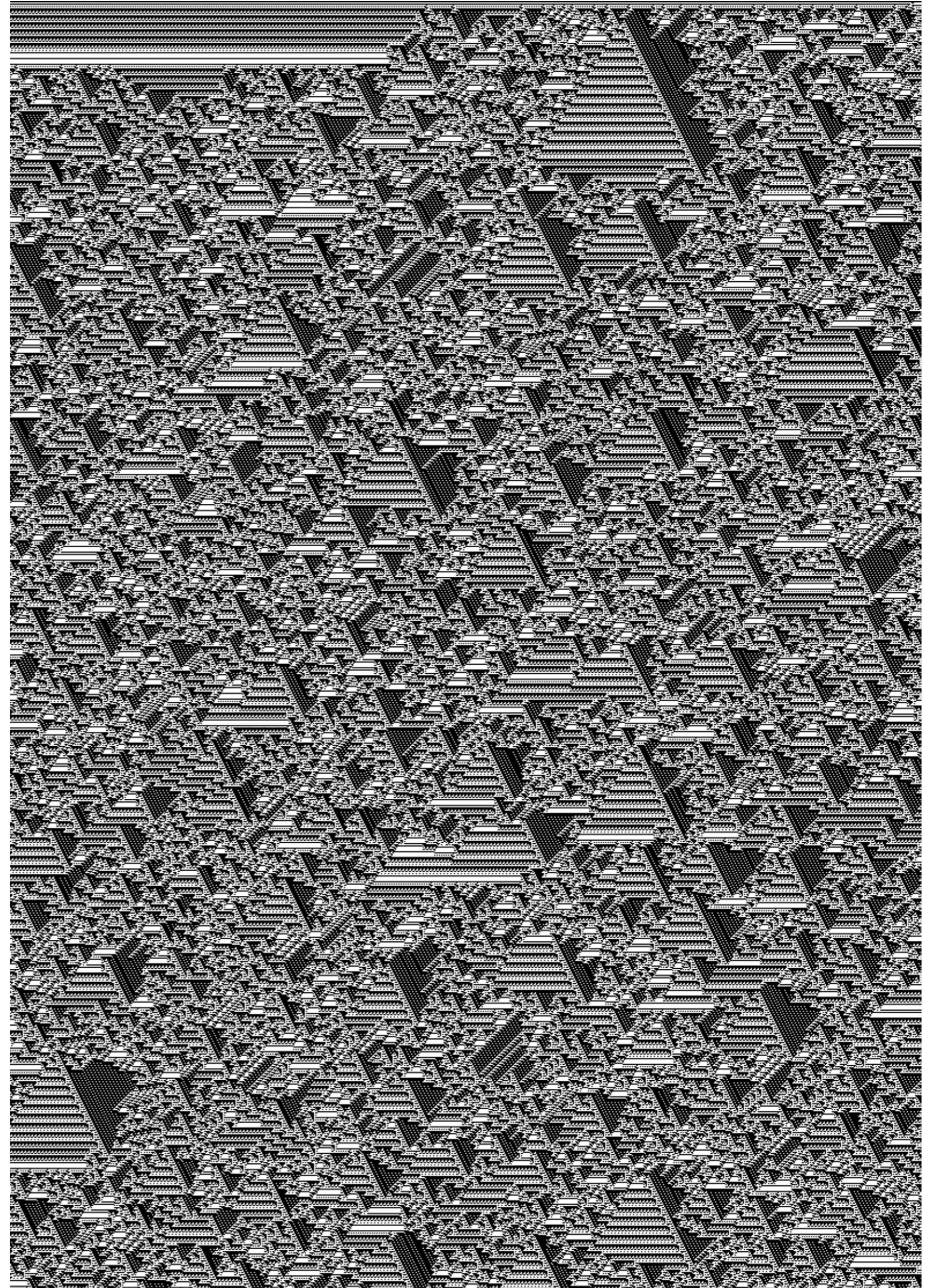
In the recent repeat of *The Secret Life of Chaos* on BBC 4 TV (March 25 2010), Jim Al’Khalili, Ian Stewart and the rest of the current popularisers of Science, continually endowed this particular Form with amazing properties, which they insisted “explain” whole areas of complex phenomena. But, having stood this view of the Universe on its head – or rather on its feet, we know that any area of mathematics cannot actually explain anything... It can describe it, categorize it, and even predict it, but NEVER explain it!

Small, revealing utterances betray the false ground of these experts.

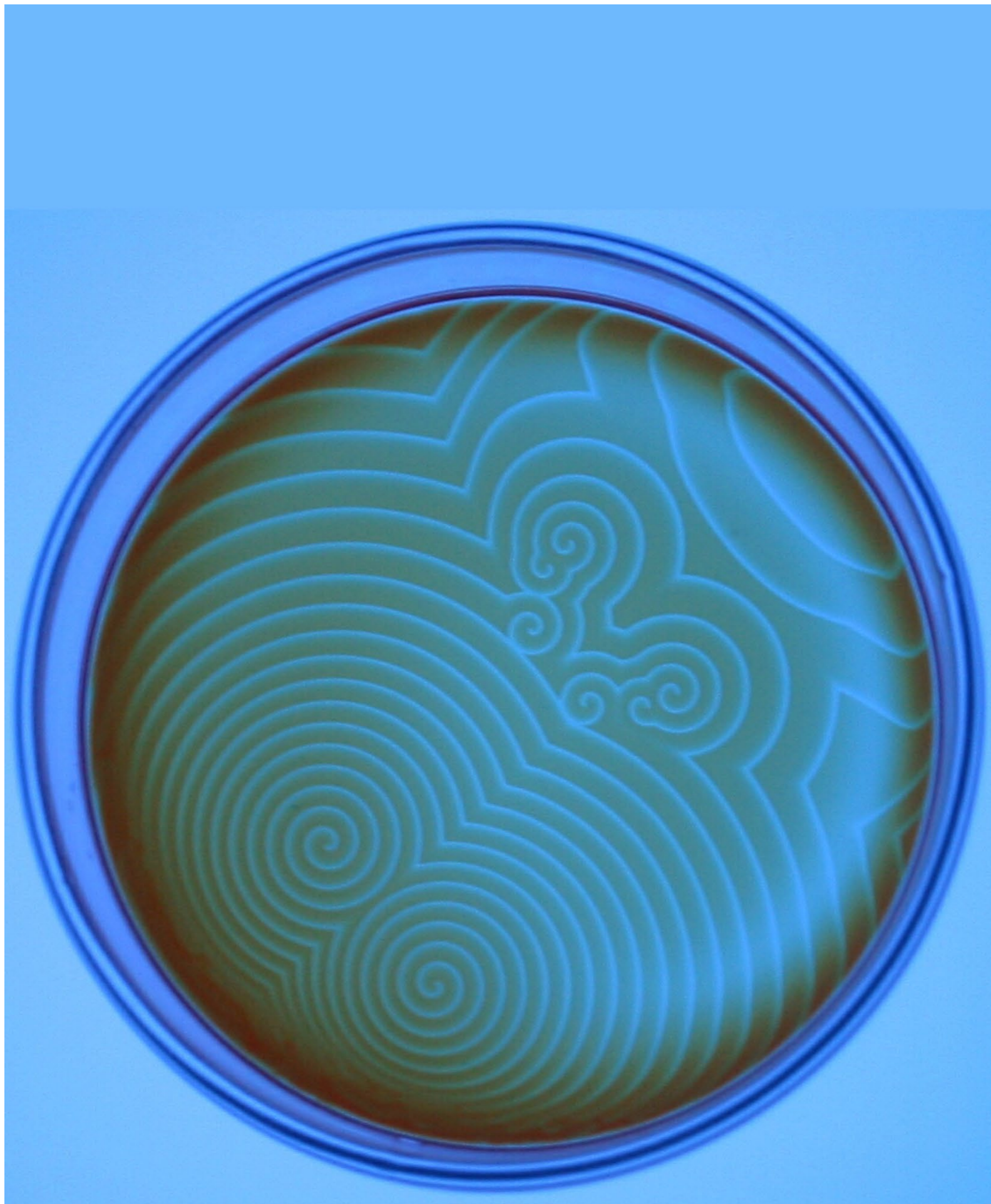
For example, in the way that they treat the universality of all Forms – where the same Forms recur in widely different areas of Reality.

Now, if Form was indeed primary, each one could only produce a single actuality, surely? But, almost innumerable cases display the very same basic Form with entirely different physical causes! – And, most crucially, dissolve into entirely different situations, when their boundaries of applicability are transgressed. If it was primary, this couldn’t happen.

Our seers suggest that “beneath” the concrete causes for such sets of phenomena (displaying the same Form), there must be a single deeper underlying cause of the whole, vast set.







Belousov-Zhabotinsky reaction fronts

But, what could that be? And where would it come from?

One of the presenters (I think it was Ian Stewart) even laughingly suggested a supreme designer, who delivered all these disembodied Forms, along with a dollop of totally inert Reality, then “let the battle commence!”

Such a joke poses the response, “But that only seems to fit your own prior position exactly! “ If it isn’t a *God*, what other non-material entity formulated all these determining abstract laws? And did these laws even exist before everything else – even before the Big Bang?

Indeed, our experts’ answer could only be “Yes!”. For, these rules are certainly seen as pre-dating Reality, and causing all its properties. There could be no other position for these theorists, because they do NOT see law and its continual development as a product of concrete Reality itself, but that concrete Reality is a product of Law!

And, of course, the only alternative to that can only be that the initial set were, and are, *eternal*.

Now Al’Khalili, Stewart, May et al are not idiots. They know full well the logic of their position, and also that, as it stands, it is totally untenable. But, they can conceive of no other alternative that they could both subscribe to and defend.

So, what could be the only reaction of such people to the emergence of Mathematical Chaos? They, of course, embrace it with great enthusiasm! It seemed to remove many of the clear and major weaknesses of a purely maths-first position. It allowed complex and unpredictable things to emanate from simple “deterministic” equations.

Diverse, almost random, patterns seemed to come out of strict equations. The previous inadequate fig-leaf of innumerable causative factors, producing Noise and Randomness, could be cast aside, and the new and better means of hiding their nakedness could be employed, and they could move about with renewed and unshamed confidence.

Yet, Mathematical Chaos still explains nothing!

Once again, it is looking at the World entirely from the viewpoint of the Forms we have abstracted from it.

Many years ago (I believe it was 25) I was working with a truly great Indian mathematician, who was researching Chaos, both in Chemical Reaction Fronts in liquids (the images from which were shown throughout this very TV programme – I believe they were Winfree’s photographs from the 1980s, though they could be current versions – they were at least identical), and the modelling of the human heart using Van der Pol’s famous equation.

As the usual first port of call, by the researchers in that institution, when computer programs were required, I was contacted with a view to displaying many of the “Chaotic Phenomena” involved as State Diagrams.

I was able to deliver what he wanted, and asked him what to me was the crucial question, “What is the difference between a normal deterministic equation, and the iterative forms that you have given to me to carry out these displays?” Now, though there will be more to it than that particular question, it nevertheless still required some sort of answer, because I was getting the required “Chaotic behaviour” very easily indeed, when such forms were employed. In spite of being a great help to this mathematician, he either would not, or could not, enlighten me.

Not then being an expert in this branch of mathematics, and also, at that time, not having pursued such questions in order to establish some sort of basis for a Philosophy of Mathematics, I could not then myself answer the question.

But, it remained one that had (when possible) to be addressed. After some 25 years occupied with other things, and latterly into the Philosophy of Science and Mathematics, I am finally in a position to answer my own question.

Yet the mathematicians have seemingly not moved at all!

Many “sleight-of-hand omissions”, in this particular TV programme, revealed that the presenters involved had certainly still not answered this question. They, several times, repeated that “simple equations” could generate the richest, yet wholly unpredictable, Chaos.

But, all the supposed “driving equations” that appeared on screen were all iterative forms, and certainly NOT ordinary equations.



Equations have both independent and dependant variables in forms such as  $y = mx + c$ , but in iterative equations these two kinds of variable can be one and the same. For, in the programme

$$z \leftrightarrow z^2 + c$$

was a given as a particular example.



This symbol actually hides the more usual form from non-mathematicians, who simply do not know what it means. The more usual and self-evident form would be:

$$z_{n+1} = z_n^2 + c$$

where the  $z$  is both the independent and the dependant variable. Knowing one value of  $z$  (in this case the  $n$ th value) we can substitute it into the iterative form and get the  $(n+1)$ th value.

Now, we have to know something of the history of Mathematics to see where such iterative forms first came from.

They were originally concocted from normal equations (initially by geometrical constructions on the graphical representations of the form) to aid in numerical derivations of the roots of the given equation. At that stage, it constituted a geometrical trick which enabled the user to proceed, step-by-step, in an infinite cyclic process which took you ever closer to the required root of the equation.

Such a never-ending process could, however, be terminated by a simple test of accuracy – when the difference between the results delivered by two successive iterations was less than a certain chosen threshold value. You chose your required accuracy and cycled round until it was achieved.

It was an effective practical frig, which could deliver the required answer. But, it was tedious in the extreme. I know this because in my youth I had to do these iterations by hand!

But a saviour appeared – the computer!

Such iterative forms could be gobbled up by a computer program, and could deliver the required answer immediately.

Iterative forms became legion. Applied with computers, these forms soon became the ideal form of an equation for obtaining roots to any desired accuracy.

And, knowing mathematicians, they did not long remain simple frigs: they were thoroughly investigated!

And, the computer, using these forms, also delivered Mathematical Chaos as an unwanted by-product in certain special cases.

Let us look at why and how such forms became so accepted.

The evident mismatch between normal deterministic equations and Reality was abundantly clear to everyone in certain important cases. The most obvious one being used in attempts to predict the Weather!

The usual equations were based on the assumption of Plurality, which saw everything in terms of Wholes and their constituent Parts, and to guarantee this structure in areas to be studied, these categories were made to happen. Experimenters used every possible means of control to ensure the isolation of appropriate Wholes, and within them accessible Parts. We say that the pluralist techniques involved isolation, extraction and abstraction of relations from Reality by the careful erection of appropriate Domains of Applicability, including the elimination of other factors both large (by holding them constant) and small (by averaging of results).

The method worked! And, it became the methodology of all scientific experiments.

But clearly, such extensive and rigid “farming” of Reality was not always possible. Mankind could not engineer parts of the Cosmos, or deliver ideal cases of the Weather for any particular spot on the surface of the Earth.

In such circumstances, it was clear that such on-going and complex situations could not be addressed in the usual mechanistic way.

What was required was to instead predict from what we could actually measure, and then take the new results to predict a subsequent situation, and so on.

Iterative Methods became the Forms in such situations. Indeed, the modern researcher often studies “Reality” unfolding before his eyes, and at a highly accelerated rate, on the screen of his computer. Now, such a revolution in the way equations were being used, required a justification.

In the old way, the equation, being an eternal form – true for all values of its independent variable, meant that you chose your arbitrary value(s) of that variable, and substituted them in, to get your required and consequent dependant variable. But, with the new method, you instead repeatedly got a new value from a previous value of it, via an iterative version of the equation.

*NOTE: I cannot rush along this line of reasoning without saying something about Reality and Mathematics. The latter though often promoted to being the determinant of Reality, is, in fact, a very purified set of derived Forms from Reality, and as such can portray only certain aspects of a “Purified Reality”, but it is never adequate to the task of delivering Reality-as-is. Nevertheless, the process of recognising, isolating, extracting and abstracting such Forms is a remarkable development by Mankind.*

*So much so, that we frequently substitute found mathematical Forms for actual unfettered Reality, and to do this is always incorrect! Yet, the study of Perfect Form (that is what Mathematics is) is a valid area of study, and is both rich and often revealing. The able mathematician can, in fact, always find a useful (if not perfect) “fit” for almost every real World situation. This is not only often very useful, but can also be highly misleading, and, concrete Reality can be easily obscured by the Ideal Form.*

Now, two forms of iterative processing are possible.

First, the non-time-dependant form would give a new value of your chosen variable, but in a seemingly arbitrary position in its possibility space (This was the case in our work on Van der Pol’s heart equation).

Second, is the more obvious time-dependant version, which would give the immediate next-in-time value of a variable from its immediately-prior time value.

The latter form was, as you will have guessed, the form used in Simulations.

So though iterative forms had originated as a mathematical frig, they could now be seen within a defensible framework of prediction moment-by-moment.

Now, as the presenters of the TV programme admitted, this cycling round was a kind of feedback.

You no longer parachuted directly into a chosen and precise situation by substitution in an eternal equation, but, instead, each new moment came from the last in this feeding-on-itself methodology. Clearly, small differences could multiply up by such techniques. These forms of Reality did not “run like a clock”, but instead could accumulate like an avalanche.

Though still an entirely formal methodology, this technique certainly resembled real interludes of Reality, which had become known as Emergences.

While old-fashioned eternal equations work well only in entirely stable situations, or in specially constructed and maintained Domains, in intrinsically unstable situations and frequently, almost everywhere in unfettered Reality, the iterative forms (though not exactly like the real thing) could with constant adjustment and massaging deliver “something-like” what happened in Reality.

The Holy Grail of Mathematical Idealism seemed to have been delivered into the mathematicians’ eager hands.

Except that the ability to predict was rapidly vanishing into Chaos.



## What is *The Secret Life of Chaos*? ...the hidden source of all that is new?

Having watched this “mathematical epic” for the second time [09/12/10] on the BBC 4 TV Channel, and even though the initial viewing had elicited a similarly immediate response, I just couldn’t just walk away from this arrant nonsense, without a further, and perhaps better, condemnation. After all, these people teach our children and regularly inflict this rubbish on the general public too.

As a mathematician myself, you might think that I would have responded more favourably to these leading popularisers, but this time around it was even more blatantly evident to observe the basic dishonesty of the piece (from all who were concerned both in its creation and in its delivery).

For, such a stance is not only unforgivable, but is intentionally leading eager students of the world into the mire, rather than to the soaring heights of the real nature of Reality. For that, they must surely be condemned!

All concerned, in this hour-long effort, turned their own blinkered considerations into what they claimed to be “the most potential-filled essences of Reality”. Forget the physicists and the biologists, they effectively averred, the real juice of Reality is always the profundity of Universal Form – of Pattern as Cause!

Jim Al’Khalili (Atom) was the main narrator, but was regularly echoed, throughout the piece, and with the same arguments by Iain Stewart (Life’s Other Secret) and others, who all agreed that, with the Advent of Mathematical Chaos, there was now in the hands of all mathematicians, everything that was needed to even tackle the wonders of Life and Consciousness.

Yet, what is it that these clever servants of real Science really do?

They were the mathematical Handmaidens of Science in the past, but now they are the group who have decided upon Forms as the driving essences of all of Reality -

which is, of course, as nonsensical as saying that the shape of your head is the essence of your Thinking!

But Form is merely superficial Shape – spatial extension! The exact same Form crops up time and time again in widely diverse areas of Reality, but, alone, it can tell us nothing of the concrete causal factors involved, which brought each and every one about by quite different means, and insists instead on endowing that which pertains to everything superficially as their determining essence!

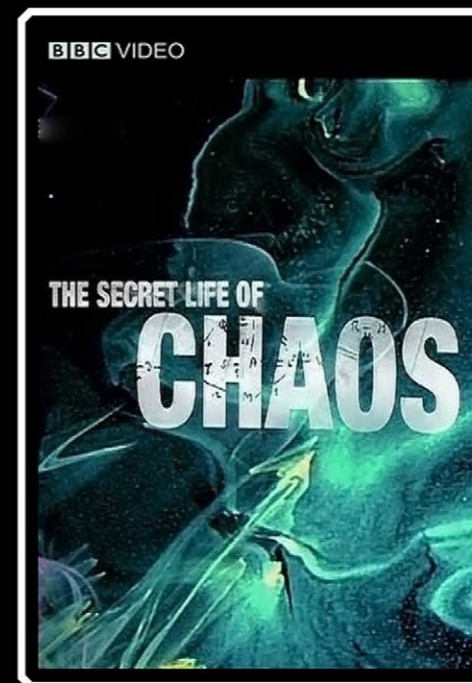
Having personally traversed not only serious Mathematics, but also both Physics and Biology, I am aware that nowhere can equations ever explain why things are the way that they are! To achieve that, you cannot restrict yourself to Form alone. It would be like discerning the essence of things from the shadows that they cast. For though such can describe and inform, even predict, they can never explain!

Indeed, it is abundantly clear that all extractions of Form taken from Reality, and intensively studied by mathematicians, DO NOT constitute the essence of Reality at all, but merely the purified patterns taken out of their appearance in Reality, into a separate and sanitised Form-Only World!

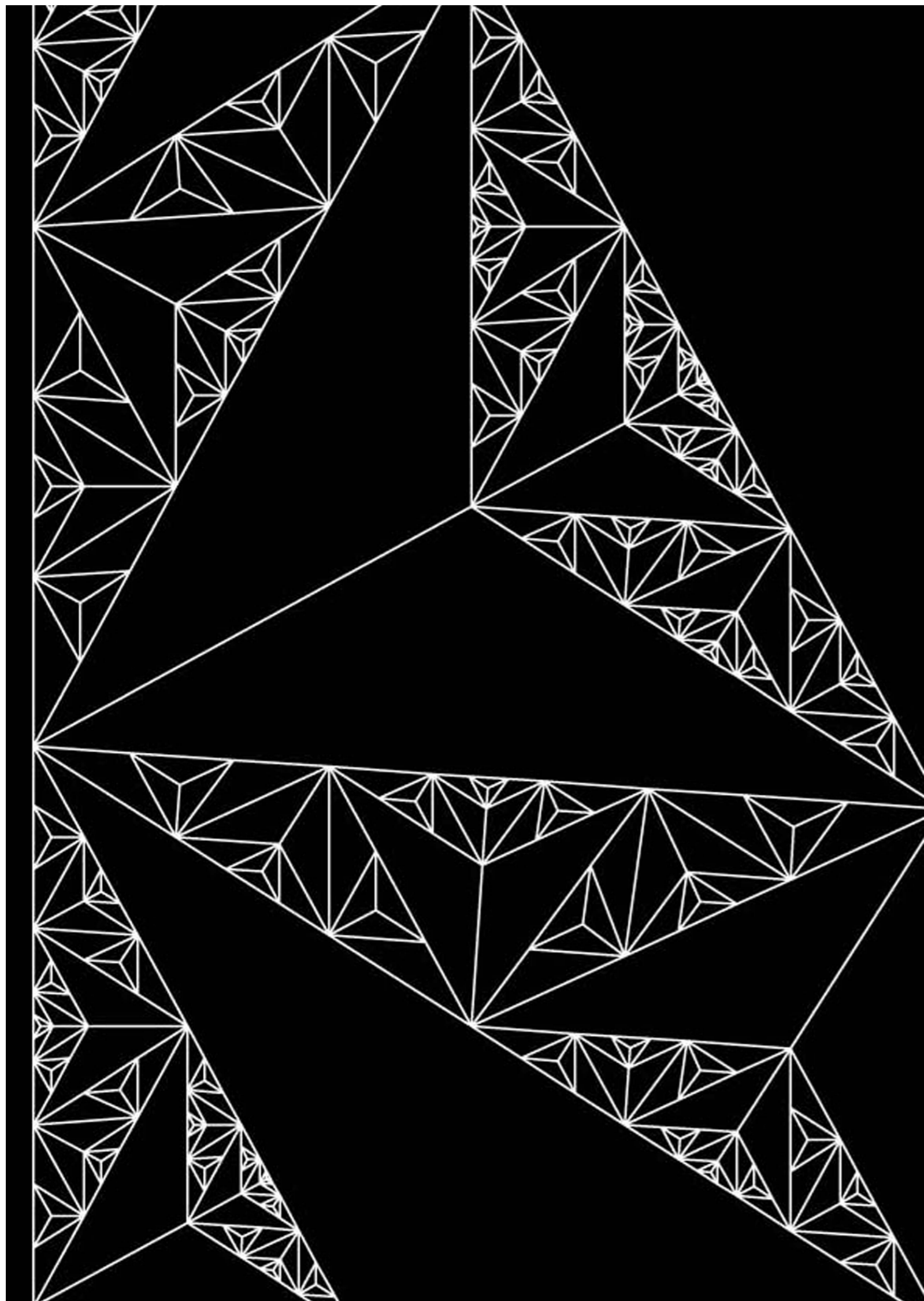
For mathematicians forget (or perhaps never knew) that NO data comes directly from Reality-as-is.

In order to reveal relations, all scientists have learned to farm Reality into small, rigidly controlled and maintained localities (Domains of Applicability) designed to make relations easier to see and to extract. Thus, before they are delivered of the extractions, they have already been extensively transformed by the processes necessary for experimentation. They are NEVER Reality-as-is!

Indeed, they have been reduced to only the mathematicians’ only real currency, *Number*.







All that is concrete has been removed, and indeed most of the other relations present have also been filtered out. Already, before the mathematician lays hands on this material, it has been turned into something, which displays only one thing – Form!

Indeed, the initial effort of our Form experts is the fairly trivial task of matching these numbers to one of their already known-about Forms. BUT, what is it that these Data are matched to? It isn't the Form from another experiment as you may think. It is a generalised version of a previous extraction. The new Data and the prior example of the Form will not match exactly. The mathematicians recognise the Pattern hidden in both sets of Data as the same Pattern, and by replacing all constants (everything other than the key varying parameters) with algebraic placeholders, they make a particular into a General Form.

It is a very long way from the original unfettered phenomenon in Reality to the General Form to which it is attached, and which is what will be investigated thereafter. Processes of Abstraction have been involved to reveal useable and manipulatable things.

But, let me emphasize a vital fact!

If anyone tried to use such a general equation in unfettered Reality it would invariably FAIL! Even if you took the version of it that matched the given Data, it would still FAIL! Can you discern the reason for this?

It is because the equation alone is insufficient! To use it, you have also to re-form the context! You have to return a sectioned-off locality of it to exactly how it was when the Data was extracted. Only then will it work! So, is what we are using the essence?

Of course not, it is horticultural Science, sometimes called Engineering, as distinct from Real Science, wherein the Real Thing is studied and explained.

Now, it is clear why we must situate the Whole of Mathematics and all its equations ONLY in that World of Pure Form – Ideality. Indeed, the actual Domains where the Data was extracted from, and where they are USED, are restricted to such Domains, and only work because everything involved has been re-located to within Ideality.

Now, such a compartmentalisation is not a major difficulty. All areas of study tend to be similarly treated, but never with that principle, which defines that World – that it contains all the essences that drive Reality itself.

Now, such is a truly remarkable standpoint! You isolate, extract and then generalise patterns from Reality until all concrete aspects of the Reality have been removed, and all that is left is Pure Form and nothing else! Indeed, only disembodied patterns are allowed in that World. And yet these contained and non-concrete, abstracted relations are taken to be the actual drivers of all of Reality? Abstractions are assumed to make all concrete phenomena happen!

There is a name for such self-kid: it is called Idealism.

And, the world composed entirely and exclusively of such Forms and nothing else is termed Ideality.

Now, truth be told, though the mathematicians are by far the worst in the worship of the non-material, such a position, though usually much less blatant, has also become widespread in the Sciences themselves.

I noticed that throughout this program all participants talked about Laws as the reasons that Reality behaved as it does!

What? No, that is not the case at all! Laws are determined by Reality doing what comes naturally and produces consequent Patterns. It is indeed the exact opposite of what the believers in Form usually assume.

Now, why would anyone actually subscribe to such an insupportable position? Surely, It has to be that they endow Reality with a Prior Plan as embodied in these eternal essences or Laws? They make these Forms primary in Reality. They are assumed to be eternal rules, which Reality is bound to obey from the very Start!

Now, once you decide on such a belief, the rest comes automatically. Yet, to me the obvious question has to be, "Who decides on these prior-existing Laws?" For remember, they are considered to be, and always have been, the directors of all the processes of Reality at every single stage from the very beginning of the Universe.)



My question is never answered! But, the universally employed answer throughout the History of Mankind was always the same: It was the Word of God!

Now, few, if any, of our present day practitioners would admit to such blasphemy of Modern Science, but nevertheless the idealist nature of their Law-driven idea of Reality cannot be disregarded!

So, we have found that these mathematicians are idealists, and study that well-defined area of Pure Form alone: they are, indeed, the sole scientists of Ideality! And it is there, and there alone, that they expect to both find and study the essence of Everything in the Real World.

But that cannot be the end of the story, for such a standpoint is not only idealist, but also pragmatist-mechanist too! It leads directly to Laplacian ideas of machine-like determinism, and Reality becomes a mere complication of basic entities and their eternal Laws.

Clearly, this will never do!

What about Life?

What about Consciousness?

The real qualities of Reality are NOT eternal. They are developable to an extreme extent, for within this Reality, Level upon Level of wholly new qualities emerged time after time.

To correctly deal with Reality, it must be taken as it comes (that is without selection, isolation, control and abstraction), and in its development (that is in its changes and in its constant evolution).

The crucial question is, "Can these be delivered by the positions of the mathematicians and scientists as have been described here?"

You already know the answer. It is "NO!"

The basic question demanded by these features of Reality, is such things as, "How do these things happen?"

"What actually creates the wholly New?"

And, "How do they precipitate significant qualitative Change?"

Also, "What guarantees Stability, and what undermines it? What is involved in an Emergence?"

Well, such questions would certainly be somewhat difficult for one of our worshippers of Form alone. Clearly, something else must be involved!"

And, the usual "condiment", which is considered to be the only possible source of everything new, has always been, in those circles, claimed to be Random Chance!

As any mathematician will tell you, if you mix up a large number of different things, all obeying different eternal laws, then come together in all sorts of possible ways, then, given enough time, Chance will throw up something, which had never existed as such ever before.

NOTE: But, this is soon thrown out as a source of innovation, because, as soon as such a mix is made, multiple and diverse processes can occur, and what will be significant could NEVER be due to a single Random Chance happening. The real organisers, within chaos, are what are termed Mutually Conducive, and Mutually Contending Processes of various Systems, and the relative success and proliferation of some systems at the expense of others.

This has been investigated by the author of this paper in a contribution entitled *Truly Natural Selection*.

Also, the basis of gene mutation infers that totally random damage can, and does, occur to the genetic materials of all living things, and in spite of these being overwhelmingly and alarmingly deleterious, very occasionally a bit of change will occur, which confers an advantage.

Such are their engines of progress: they are seen as happening all the time and sometimes are marginally advantageous, and millions of these chance occurrences gradually add up to innovative advances in organisms.

NOTE: Not in my research they don't! The Random Chance excuse for everything simply doesn't wash. You may ask why I dismiss this as a mere placeholder? Well, the argument isn't even aware of Stability and Emergences as the phases of development, and hence has no idea of the trajectory of changes that is an Emergence.



Now, this "vital ingredient" of purely Random Chance managed to keep the wolves from the door for many years, but it too, is nonsense, and became more and more threadbare as Science progressed.

Yet even then, a related saviour was discovered, which might well fill the void left by the demise of Random Chance. It was, of course, *Chaos!*

Mathematicians found that certain deterministic equations, when restructured into Iterative Forms, produced wholly unpredictable results as they slowly built up graph-like state diagrams of what was possible. The remarkable thing was that each time they were used, even if the differences were incredibly tiny between the prior and the new use, they would generate different results.

You could not predict from the equations!

Now, think about it! They were using their "dearest essences" to map what would happen, and it didn't work.

The SAME relations all by themselves could and did deliver, with iterative versions, different things every time. Could this be the replacement for Random Chance in the search for the origins of real novelty?

Indeed, Chaos seemed to be infinitely superior to Random Chance, because it produced non-predictable patterns too.

In this TV programme, the discovery of this aspect of these equations was ascribed to Alan Turing, in which he attempted to show the diverse, but similar, patterns on the fur of various animals.



This was ideal. What, patterns from patterns! It's a miracle!

The programme presenters also brought in the oscillating chemical reactions first discovered by a Russian scientist, which also generated expected, but NOT precisely predictable, patterns.

Now, I have to say that it is certainly dishonest of any researchers to bring in undemonstrated "evidence", that the layman has no chance of refuting, and spreading it all on so thick that the viewer just has to accept it!

For, their arguments are NOT as they inferred at all!

As it happens, I was personally involved in the 1980s in a whole series of research areas, which could not be more relevant to these claims. In one project, I was working with chemists and mathematicians investigating the reaction fronts in undisturbed chemical reactions between liquids (exactly what were used as illustrations in this TV programme though we were doing it 25 years previously). I even remember what these patterns were called. They were termed Toroidal Scrolls (and my closest colleague did the mathematics of it). I also worked with the same mathematician by writing (upon his suggestion), a whole series of state diagram productions of equations, which delivered chaotic results. [These were based on Van der Pol's equations adapted from electronics to instead represent the functioning of the Human Heart]

So, I am not a viewer who can be misled. I know about Chaos! I even know why it occurs. Did the makers of this TV programme reveal that? They did not!

But, Chaos is nothing magical, nor is it creative!

It occurs when Rates of Change occur in what are termed Differential Equations. (The so-called Non Linear Equations). Now, what is special about these is that the extractable relations always involve these Rates of Change of given variables, but the actual parent variables themselves are required!

Now, mathematicians are well aware as to how to obtain these primary variables: they integrate the NLEs.

But, they will also relate that when you do this it always involves Constants of Integration, and these are the problem. You can, in certain cases, get round this by knowing initial conditions, but in chaotic systems guess what happens?

You've guessed it! You never get the same pattern, for the tiniest differences in initial conditions will give different patterns in the results.

How do I know this? It was because it was my job to reveal all of this in the research effort. I could give Chapter and Verse. And, could such indeterminacy lead to innovation? NO!

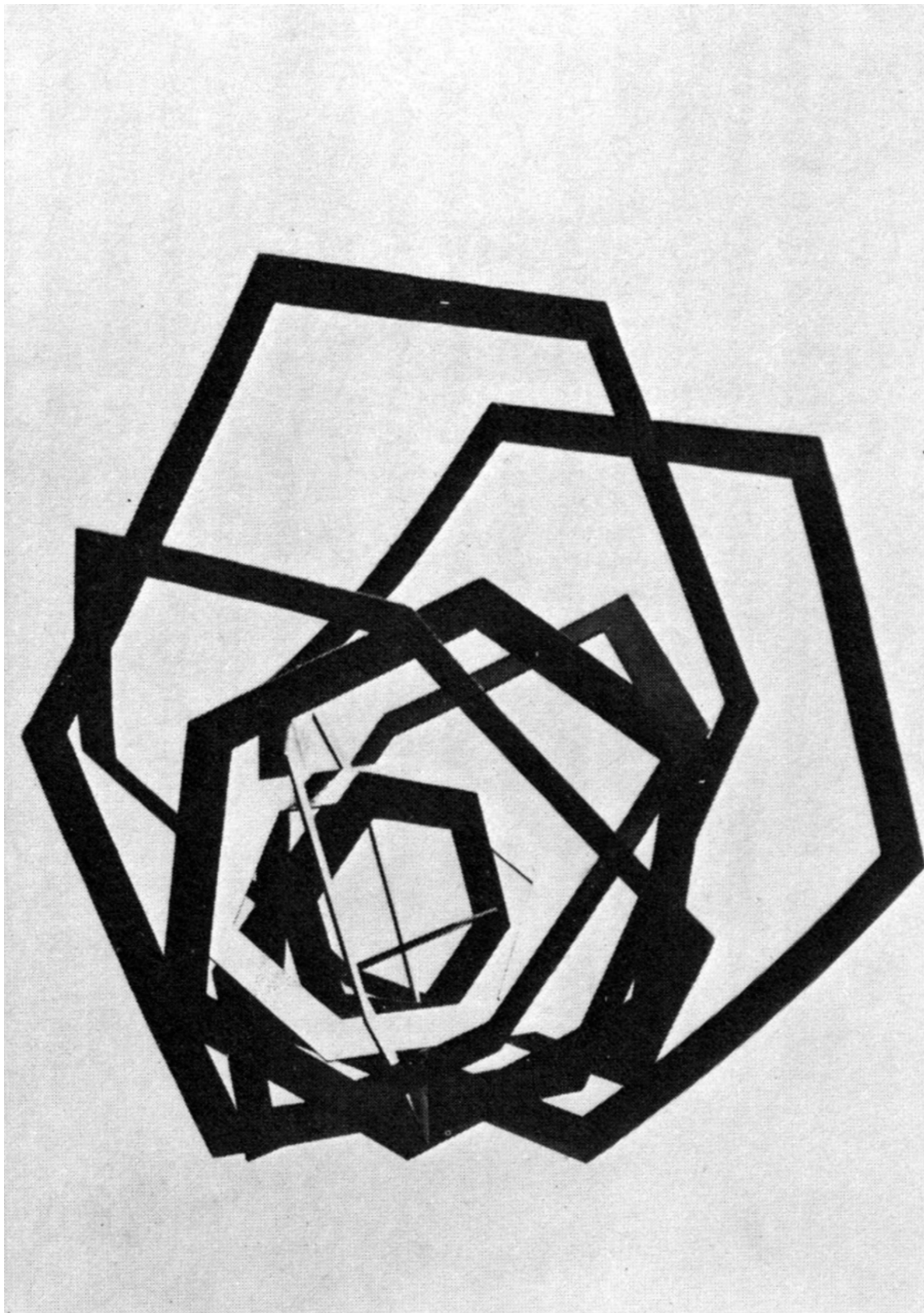
The crucial thing about Chaos was not innovation, but crucial *variability*. The iterative forms showed how by using one known state to find another, and continuously repeating this process, it would drift the system, though invariably towards an avalanche of destruction - never a miracle of qualitative Change.

So, when it comes to Evolution, Chaos is just another placeholder for real and significant Qualitative Change. It's the new condiment! And condiments don't make a meal!

And, a very handy one too! For it prevents us from precise prediction, and therefore in the hands of those who don't understand it, opens the door to hidden Qualitative Change. But, it just isn't true! What is true is Emergence! But, that is never a subject for researchers into Ideality!







## Chaos, Science and Marxism

I include here another review of this TV programme by a fellow Marxist, Daniel Morley's [Chaos, Science and Marxism](#).

It is not featured in this journal as being a significant Marxist view of Mathematical Chaos, it is not. I include it to reveal what vastly different approaches and ideas hide under the banner of Marxist theory. A comparison with the foregoing set of papers written by Marxist philosopher Jim Schofield, makes this very clear. Indeed this Marxist considers that the serious extension of Marxism into the sciences is crucial, not merely to enrich and develop Marxism itself, which it certainly does, but perhaps even more importantly, to really *criticise* and set back on the correct path, the entirety of 20th century Physics, which is still mired in an unprecedented 100 year-long crisis, precipitated by the discovery of the quantum.

In reaction it retreated into a firmly *idealist* stance (something no Marxist should be able to stomach), and brought the entire discipline to an explanatory halt.

The Marxist intervention in Science is bringing developments in both disciplines. Current work in this journal on a Marxist refutation of the Copenhagen Interpretation of Quantum Theory nears completion.

The screenshot shows a webpage with a red header. The main title is "In Defence of Marxism" in a stylized font. Below the header is a navigation menu with links for Home, The IMT, History & Theory, Audio & Video, and Comments & Opinion. There are also dropdown menus for Topics, Africa, The Americas, Asia, Europe, and Middle East. The article title is "Chaos, Science and Marxism" written by Daniel Morley on Wednesday, 18 May 2011. It includes social media sharing buttons for Facebook (328 likes), Google+, and Twitter. The article text discusses a BBC documentary and the relationship between order and chaos. A small image of a Lorenz attractor is included, with a caption: "Lorenz attractor. Illustration: Wikimol/Wikipedia".



## Notes on Daniel Morley's Review marxism and science

Some years ago I wrote a scathing review of the TV programme entitled *The Secret Life of Chaos*, and I have recently come across this diametrically opposite review by a Daniel Morley, who also purports to be a Marxist like myself, but heaps nothing but praise upon the team of scientists who presented the BBC programme.

Clearly, for two writers, supposedly writing from the common stance of Marxism to arrive at two such diametrically opposed positions must indicate that there is something very wrong in one or the other of these professed Marxist positions. So, though the TV programme in question may now be some time ago, the real position of a Marxist to such stuff must be firmly established – for theory is actually our major strength.

The stance is too important for such opposite conclusions to be drawn from the exact same reviewed source. So, here goes, starting with a few points about Morley's offering.

I am assuming that Daniel Morley, the writer of *Chaos, Science and Marxism* is an American (although I might be wrong), for he seems to think that religion needs debunking as a priority, and evidently something like that seems to be necessary in extensive areas of the United States, if their current politics is anything to go by.

Yet, tackling committed religionists doesn't seem to be good targeting, with a title like *Chaos, Science and Marxism*. You would think that he is about to tackle the primary intellectual problem of the age – either by a Marxist correcting the errors in present day Sub Atomic Physics, or, as seems to be his slant, with Science correcting the errors in Marxism – for both purposes do have a measure of validity.

Indeed, the significant omission in Marxist writings for a considerable period, has been in dealing with Science, both in its discoveries, and in its changing philosophical stance.

Since Lenin's *Materialism and Empirio Criticism*, which was an attack upon the positivist tendency in Science at that time, there seems to have been NO major assault upon the biggest crisis in Science for centuries, which still exists, even after 100 years in that area of Physics.

Though individual Marxist scientists such as V. Gordon Childe (the archaeologist), have made significant contributions to their particular disciplines, it is remarkable that no Marxist has tackled the canker at the heart of Modern Physics. And remarkably it is one of the stalwarts of the present idealist stance in Physics – Jim Al'Khalili, who Morley (the Marxist?) turns to, in order to applaud his "important contribution" on *Chaos*.

Now, I suppose that I must declare my position.

I too am a Marxist (for more than 50 years), and am also a qualified physicist. In addition, I have also worked with a world-class mathematician, Jagan Gonatam, for an extended period, when he was doing important work, involving mathematical Chaos, on a major modelling of the human heart to tackle both Fibrillations and Heart Failure. So I certainly know what that area is all about.

My remit, in my current research, is to tackle the almighty crisis in my discipline, and to do it philosophically from the materialist standpoint of Marxism.

It is clear to me that current "Marxism" is found to be clearly lacking in what it contributes to this problem. And, consequently I had to the first to undertake major philosophic researches both in Marxism itself with my *Theory of Emergences*, and in Physics, with *The Theory of the Double Slit Experiments*.

The wherewithal to tackle such problems came initially from my secondary and tertiary disciplines – I am a mathematician, a computer scientist and a biologist. And after over 25 years spent in assisting researchers in many different disciplines, I found valuable succour (philosophical) in some very surprising places. Perhaps





the most surprising was what I learned in producing, along with a brilliant expert in the subject, multimedia aids for the teaching of dance performance and choreography, which demanded means of supplying users with consummate access and control of exemplar video footage. It turned out that a remarkable width of new research was essential to deliver what was needed.

NOTE: The research won an award in the 1989 National Video Awards Ceremony in Brighton.

The more general result was the aforementioned Theory of Emergences, and this equipped me to tackle the many anomalies in the Copenhagen Interpretation of Quantum Theory, and, indeed, solve ALL the anomalies in the famous Double Slit Experiments solely due to finally understanding Dichotomous Pairs and the consequences of incorrect premises (as revealed by Hegel).

With a vigorous criticism of the premises involved in Modern Sub Atomic Physics, it soon became clear that the host of impasses resulting from the Copenhagen retreat, were due to unsound premises, and attacking and changing them solved the cornerstone problem – The Double Slit Experiments. Now, of course, such a success was not yet definitive, but clearly sound dialectical materialist method had been understood and applied with excellent results.

I must apologize for the current diversion, but I had to reveal my experience and ground – for it would be the immediate response of the reader of the above to require who I am, and what has brought me to such positions. I am not an expert on Marx: I am, however, a theorist and a Marxist – in his revolutionary tradition. And that, surely, is what is necessary to deal with Science in its current floundering state?

Morley talks of Evolution, but only as some sort of (although he never explained as to what that is) complex of Natural Laws! He reveals a total absence of any understandable details in his subscription to this concept.

He gives what he considers are crucial examples such as morphogenesis and the creation of sand dunes, to which he ascribes a complex mix of natural laws producing situations that not only display regularity but also predictability. As is often the case, it is this latter predictability that is supposed to confirm that phenomena are understood.

But they are not! What has been addressed is pattern and form, and certainly NOT explanation. Many things can be predicted from the patterns they display, and our methods of encapsulating such into purely formal equations. But, that NEVER delivers the reasons why - No explanations are forthcoming, apart from the totally idealist one that Form itself causes all phenomena.

That is absolute nonsense I'm afraid! Form is the result of real concrete causes, and to understand you have to uncover them.

Morley doesn't do that! His mention of The Unity of Opposites as if it is an explanation is ridiculous - it is clearly a description of something that is evident, but the "rule" doesn't cause the phenomena!

If he is to use such ideas, he MUST explain how it actually works, and, of course, why it is so!

He also includes what he calls the emergence of simplicity through complexity and vice versa. But such "observations" without detailed explanation are just empty generalities.

They cannot equip us to deal with things and act accordingly: it is a passive and pure descriptive, after-the-event kind of analysis – useless in directing what must be done, AND NOW! Indeed, it is the essential companion of pragmatism, if it works, it is right, and the switching between of opposites as necessary.

Morley then goes on to deal with Al'Khalili's position.

Morley's take on what he calls the "problem of unpredictability in Reality", is the classic one of correctly criticising Newtonian Classical Mechanical materialism as totally inadequate to complex and changing situations.

With Al'Khalili, he uses the example of an orary – a mechanical model of the Solar System, to illustrate the inadequacies of such a model, and such an approach!

NOTE: It would also be vital, at such a point in criticising such methods to also criticise solutions like the Ptolemaic model of the Solar System, which while correctly allowing predictions. Was in fact totally incorrect, by merely building up all known data into a model until it has enough Objective Content to be useful,

even though it was totally incorrect as an explanation of the actual system described. Such pragmatic models can rule the roost for centuries, but in doing so make further developments in understanding impossible! Indeed, much later, James Clerk Maxwell assumed such a pragmatical model, which was the basis for his famous Electromagnetic Equations. These were extremely useful, and still are, and via his analogistic model, provided a superior model of a Substrate (then called the Ether), even though all of his constructs have never actually been discovered.

Quite correctly Morley describes the Orary as a "complete system of fixed parts, which always act upon one another in the same way". Essentially the Laws are eternal and simply add together (the Principle of Plurality) and absolutely nothing else is happening! Morley concentrates upon the incompleteness of such systems.

But as his primary purpose is to reject the assumption of God, he concentrates upon what drives this Solar System "to set it in initial motion". So, perhaps because of these limited purposes, he misses many important criticisms, and with just these quite limited criticisms of mechanical materialism, jumps straight from there to the problem of so-called Complex Systems, such as the Weather!

Morley follows Al'Khalili (and the current consensus in Science) by going from individual entities to systems, and is reasonably happy with Al'Khalili's sand grains and sand dune formation to accept that theory as "Laws of collections of things" – in the chosen case producing predictable sand dunes.

You can see where Al'khalili is heading – "we can predict overall appearances of sand dunes", but confusingly, he characterises this with Categorisation in several examples, which is, of course, very different indeed from involving the rich experiences, over extended periods, reached by many older experienced generations of humans. It just is not the same thing at all!

Now, clearly too much is being placed in this trivial collective example, and Morley knows it. So, at this point, Morley introduces the crucial feedback effect

Holism is the philosophical basis for Marxism. For, that stance alone actually defines behaviour in Reality as NOT due to eternal Laws, but due to multiple, mutually-

affecting factors, and also taken one step further to having certain results re-affecting their own causes down the line – feedback, but as I prefer to call it Recursion.

Clearly, having all of these involved is very different, indeed, to eternal Laws merely adding together. The modifiable nature of such factors changes both the involved factors and their combined effects.

But Morley brings it in via a profoundly different context, and hopes that it will step over the limitations of his still-present Pluralist approach.

But, any "Marxist promise" in such a move is immediately lost, by merely using "Quantity into Quality", in which he has small feedback effects "summing", time after time, until the situation flips into another mode, with this phrase as the reason!

That may be a simplified first approximation, but it incorrectly infers a smooth diversion, and a final switch. That does NOT deliver the necessary cause! In an important sense, he is straight-jacketing what he calls Complex Systems into a version of the sand grains/sand dunes scenario – as when a process can change over in this way.

But, in Reality such change-overs are not mere cases of some rule – Quantity into Quality – the process is not as predictable as that, it is usually a whole cascade of such qualitative changes, which via an unpredictable route finally arrives at a wholly new Stability.

Morley does not understand Stability and real Qualitative Change. He, in a way very different from Marxism as I understand it, formalises things into simplified final forms. Like a mathematician!

In criticising Al'Khalili (and all others subscribed to the modern idea of Chaos) Morley does differ with the Butterfly Effect, by adding "all the other factors" – but it is still adding. He doesn't see the Laws involved as fundamentally changing, nor does he involve the idea of Stability or dissociation in his conception. His position is not very Marxist. And this isn't a judgement against some ideal set of a criteria of what a Marxist should be, it is a philosophical reality.

Morley goes on to his criticism of Al'Khalili on the matter of Idealism, which he defines as "Mind creating or



delivering Matter.” He takes their version of development as merely due to the summation of small divergences, which ultimately flip the situation over into a different one, and asks where they come from. He also requires the source of the delivering formal relation or rule. He alternatively suggests that the formal law only roughly generalises the infinitely complex overall system of cause and effect that is nature.

He then goes on to relate the presenter’s feedback system, that is the on-screen display of a camera pointed at that same display, which with an incipient delay produces a chaotic picture very quickly. Morley insists that the principal behind this is extremely important for Marxists. He actually interprets it in terms of Superstructure and Base, which I’m afraid is total nonsense. Feedback this may be, but it is purely formal, and delivers precisely zero of what Morley claims for it.

Here is a sample sentence. “Just as all natural things must exhibit laws and organisation so they enter into crisis, break apart and cease to exist.” He even puts down the existence of life to a result of such a process – the final conclusion is asinine – consciousness only occurs because the potential for it was always present in nature!

Relating this to class struggle doesn’t mean anything at all.



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