



**The Parting of the Ways**  
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[www.e-journal.org.uk/shape](http://www.e-journal.org.uk/shape)

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Shape Journal

## **The Parting of the Ways**

Special Issue 13

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# The Parting of the Ways

## An Introduction



Welcome to the 13th Special Issue of the **SHAPE Journal**.

The following paper, which attempts to identify and display the exact point at which Science took the formal, idealist path, and abandoned the theoretical/explanatory tradition almost entirely, to negate its former purposes and direction, and replace them with an inevitable and indeed terminal dead end, as its alternative.

It is not an easy task, for the most important moves for this ultimate bifurcation, were taken long before the clear and unambiguous split occurred. For, up till that final switch, a dual situation had not only existed, but had facilitated a reasonable amalgam, which though not entirely coherent, did manage to keep the best of both the involved flawed approaches, and thus keep things open for a reasonable, if somewhat eclectic, view of Reality.

So, this task has to start with those long-held, yet erroneous assumptions and principles, then describe just how such a basically contradictory mix of formalist abstract equations and causal explanations could between them approximate closely enough to Reality to allow a plausible and useful amalgam, that on close inspection was certainly unsustainable and indeed conflicting.

It was, of course, possible because the two dissimilar halves of the conceptions were used for very different functions - one was for use, while the other was for explanation: the latter was an effective explanatory narrative accompanying the quantitative use of the equation in predictions during actual functional use. The two were, in effect, “complementary” and delivered an overall mix, which delivered on both important fronts.

Now, whenever such contradictory dichotomies exist, it is because both sides of that contradiction are significantly flawed, while at the same time reflecting some real, and indeed vital, aspect of the situation. Both sides contain some Objective Content.

Now, this did indeed suffice for a very long, and indeed, fruitful period, until the crisis caused by the appearance of the Quantum, revealed the two sides as clearly incompatible.

Now, believe it or not, such crises are regular occurrences

in Science, and they can only be resolved (to an extent), by new conceptions, which include both appearances as different views of the “same thing”.

But, in the case of the Quantum, these ideas were the only way to solve certain theoretical difficulties, but at the same time were immediately in total contradiction with current explanations. And what’s more there seemed to exist in an irreconcilable contradiction between the behaviours of the same thing, which could sometimes act like an extended wave, while at others it had to be a strictly localised particle.

This Wave/Particle Duality ruined the old compromise forever, and no transcending higher conception (including both) seemed possible.

The result was the wholesale abandonment of all explanatory Theory as mere self-kid, and many phenomena were considered to be something like Kant’s “Unknowable Things in Themselves”. And this left the arranged, extracted and abstracted equations as the ONLY undisputable pieces of true Reality available to the scientists.

These had long been considered as having been delivered by the carefully organised processes, which resulted in these as the crucial driving essences of the given situation.

Now clearly such a conception is and always was totally idealist, because an equation explains absolutely nothing – it only describes a displayed and extracted pattern or relation.

If, before this radical change, you were to ask what was happening in a given situation of an involved scientist, he or she would always give you the agreed explanatory reasons, and only give the equation as a formal tool for predicting a know pattern of relation, where and when required.

The total debunking of all explanations, therefore, meant that only the equations were left. The idealist/materialist amalgam was finished, and replaced with the formal equation alone, as the sole dependable essence of a given phenomenon.

Now, remember, these forms had been used by scientists for many, many generations, so all scientists depended upon them, and they had always worked!

But, let us be crystal clear what they were: they were descriptions of a relation or pattern over a range of circumstances, but their power was in their simplicity and succinctness. You simply inserted known values to get the values you needed.

But they never told you why! Now as the detailed explanations of the experimental processes and that were happening were now banned, scientists had no concrete Reality, with its explanations to suggest further work. Instead the primacy of that concrete Reality had been dumped. The primary encapsulation of the Truth of Reality was now considered to be the Equation, and only the Equation. A supposed and totally disembodied driving essence was all that was now available to suggest further investigations. The equation had become primary, and NOT the concrete situation, for that, and its explanations were now thrown away as totally unreliable.

Do you disagree?

Ask a modern day sub-atomic scientist to explain something and he will always give you THE EQUATION.

Ask him where to go to next, and he will show you something IN that equations which he interprets as some hidden “entity”, and will give you an experiment to confirm or deny his speculation.

Experiments are now demoted to become necessary confirmations of speculations extracted from their “wholly reliable” Equations and nothing else.

Even now, it cannot be said that what has happened has been made fully clear. Almost all scientists would simply disagree with the above on purely pragmatic grounds. Their idealism has become of the Positivist kind.

Now, as you might by now have guessed, this paper couldn’t end with the above mere statement of position. It will have to be established beyond question, and the assertions made above proved beyond any doubt. Indeed,

the consequences of this major retreat will need to be proved in many concrete examples.

Now, such a task, will not only have a scientific side, whether formal or explanatory: it will also have a vital philosophical side, for that is what the proponents of the New Science also put forwards as their valid justification. They insist that what they were doing was both correct and philosophically sophisticated. They attempted to justify their retreat in “high philosophic terms”.

So, this writer is more than willing to take on the task of demolishing their position philosophically too. And to this end he will deliver it fully in his forthcoming book – Holistic Science. Now, the notes and papers for this work already amount to 235,000 words. This author has also found it to be necessary to establish his own credentials for coming up with his contrary position, and that this has come from 50 years work in Science Education at every single level, which finally led to his reaching a professorial level post in London University, after a whole series of successive promotions in Hong Kong, Glasgow and London.

Finally, remember that the main paper included herewith is not the final completed task, as outlined above, but it does lay out the main points and may persuade the reader to go on to tackling the book when published in the near future.

Jim Schofield Sept 2012



## Positioning of The Parting of the Ways

Now the following paper was commenced with perhaps just a new slant upon the crucial Crisis in Physics, which led to the Copenhagen Interpretation of Quantum Theory, and then just grew to prodigious proportions – attempting to “omit nothing” of the years of discoveries and revelations that have defined both the short comings of the traditional scientific standpoints, and the great potentials evident in an approach, which though described as holist, is, in fact, much more detailed and investigative than the classical (or Buddhist) version of that standpoint, which more or less has everything affecting everything else, and resulting in almost continual and impenetrable change.

The New Holism is not merely the diametrical opposite of Plurality, and in fact accepts that position in many majorly static situations. So, the conception of Plurality is not always miles from actual Reality, but can indeed approximate to it in appropriate circumstances. And, perhaps, most importantly, when such stability is not a natural occurrence, the approach invariably involves the artificial arrangement of a highly stable situation, or man-devised, constructed and steadfastly maintained Domain, in which to conduct his experiments.

These forms of local Stability can, and indeed do, reveal what seem to be reliable relations, which can be extracted, generalised and abstracted into usable equations, but only as long as they are used totally within their original producing Domains.

Now, to those familiar with the writings of this author, there will be many who insist that they have heard all of this before, and that “there is nothing new here”. But I don’t produce all these papers to merely say what I have said many times before. There is always “something new”, and once I start to try to express it, I am always aware that it may have had multiple and crucial resonances for me, but if merely mentioned as a short statement, it is most likely that such important content will not be clearly evident. Hence, the explosion of such additions to sit squarely in the midst of a dull and interrelated set of conceptions is surely absolutely necessary.

Indeed, without such an expansion, some aspect of the importance of a new addition may well be lost even on the author himself.

So, the necessary extended version has to have two main aims.

First, it is to position additions and new slants within a comprehensive and coherent, overall view for the author, as well as delivering the idea plus its wider context theoretically to the reader new to these ideas.

Clearly, the latter criterion demands the publication of the piece, somewhere where it will attract the readers to the latest position (as near as possible without it becoming a full book, of course).

So, the question becomes, “Where can it be published?”

We have SHAPE Journal and the SHAPE Blog, though the former is perhaps not ideal as it certainly will include many other earlier papers covering the same general ideas, while the Blog is usually more accessible, with generally short introductions on more limited areas – hopefully to recruit more readers to the Journal. So, that doesn’t seem ideal either.

For the time being these do remain unpublished, and only perform the initially explained personal objective of meaningful extension of already developed ideas, but a wider use must somehow be arrived at.

# The Parting of the Ways

## The Magical Copenhagen Interpretation versus the Science of Qualitative Changes

Long ago in quite another place and time, I showed an appreciable ability in Mathematics, which I assumed (along with many others with similar talents) was the receptacle for all the driving essences that made the World what it was. And the subsequent way in which I was taught Physics also confirmed my ever strengthening desire to, in addition, begin to understand that World as well as appreciate its wonderful forms.

Clearly, the Grammar Schools of my era were similarly so orientated, and therefore produced science students with roughly the same sort of ideas, who energetically wanted to pursue the same important path. So, when it came to specialising (which was also considered necessary in that environment) I naturally studied Mathematics and Physics at “A” level, and secured a place at University for an honours Degree Course in Physics.

But, I was to be greatly disappointed by what I received on that Course.

Something significant had happened to Physics, which radically altered its appeal. From the outset my desired Explanations were simply not forthcoming, while the diverse Forms of Mathematics were dominant absolutely everywhere, and the preoccupation of the New Physics seemed to be to wrest innumerable formal relations from very carefully organised and rigidly controlled and maintained patches of Reality termed Domains.

Reality at large, and totally unfettered, was never addressed, and instead the whole approach was to “farm” situations, so as to make the extraction of relations as easy as possible, then turn these into abstract equations, with both their initial particular context, and, in addition, a very general applicability to a wide range of different situations displaying the same patterns.

Indeed, all such extractions, not only were considered for that part of the World under detailed study, but also as remarkable general forms, that immediately entered into a vast library of such Forms, where they were very quickly established as being appropriate for extensive study, in themselves, as crucial and usable, *abstract* Forms.

Indeed, they were also the very resources, which were the sole content of the Science of Mathematics, where they were found to be manipulatable in many diverse ways,

and adaptable to many different and unrelated “natural” phenomena.

Indeed, as soon as a decent and reliable set of data was available from any physicist, the mathematicians could be relied upon to deliver an appropriate matching Form, and by various straight forward techniques one or another of these could be fitted up using the particular data, to redefine all constants in the general form to produce a Law for the given investigation.

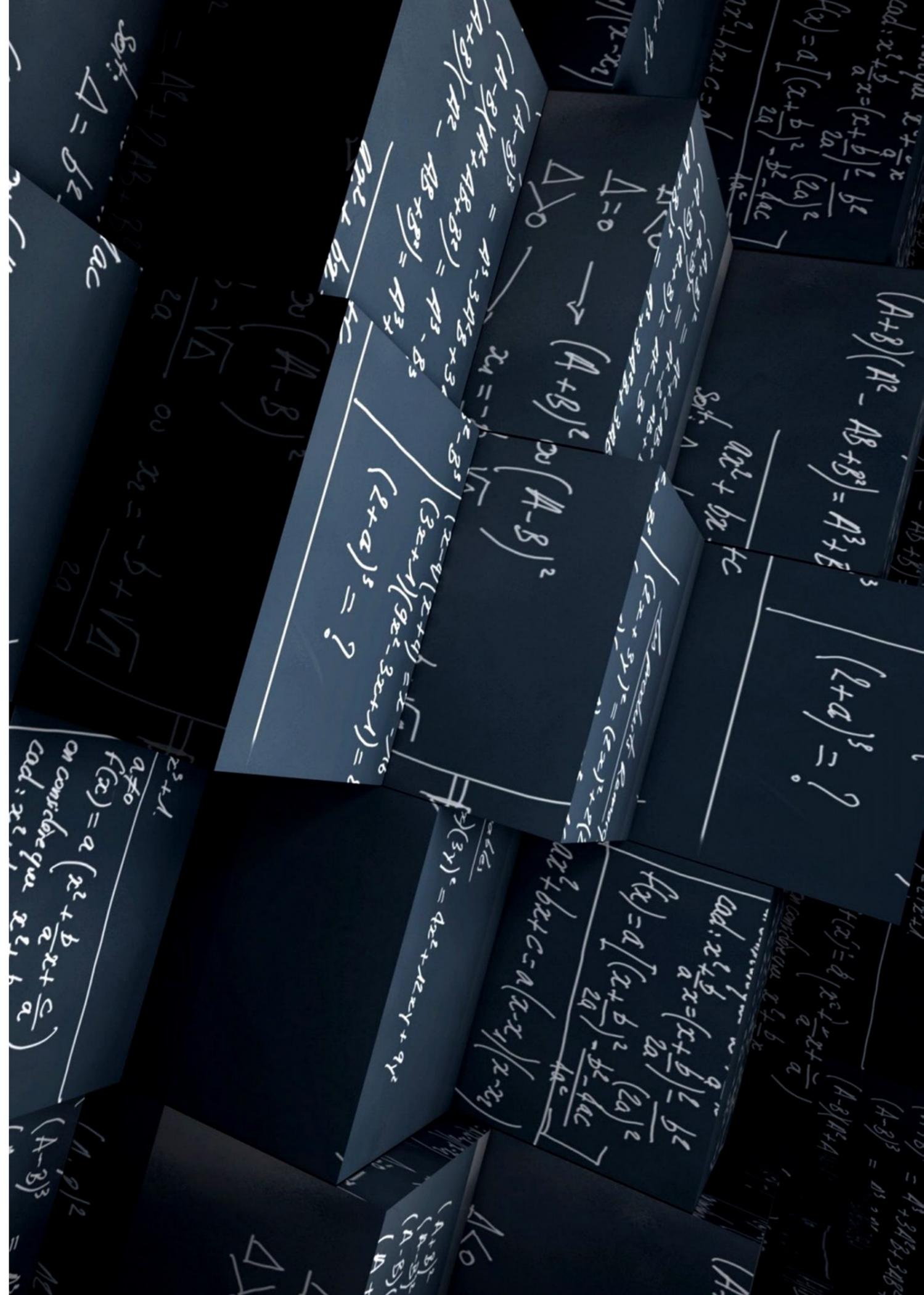
Now it must be appreciated that two quite different sciences were here dealing with the same results but for quite different objectives. Though the physicists were supposedly investigating some aspect of Reality, the mathematicians were actually investigating all the features of particular abstract forms. And these certainly did NOT match on all fronts.

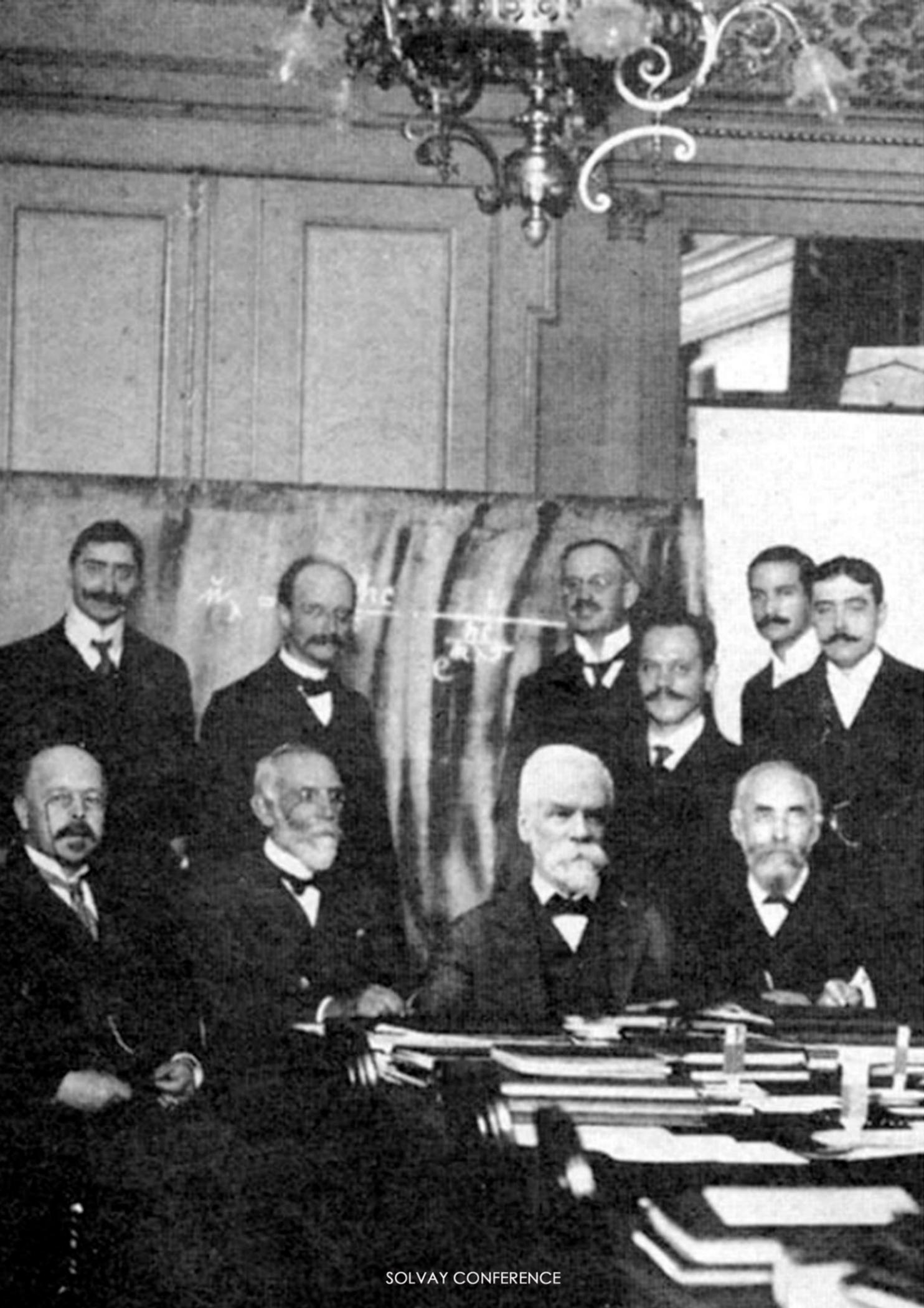
Nevertheless, the considerable range of techniques, which the mathematicians had developed, was considered a godsend by the physicists, who soon were almost as able mathematically as they were physically. It was surprising just what could be revealed by formal (mathematical) means alone.

Then, out of the blue, the inevitable cataclysmic consequences of Quantum Theory for the classical assumptions of Science led to a series of major crises. And the mathematician-scientists were all too well equipped to find the formal means to enable solutions to be found, but such involved what had always been prohibited by the usual classical relation between Forms and Reality.

An amazing mix of Probability with deterministic equations was constructed, which saw what had always been determinations of positions for a given particle, and turned them into different probabilities of that particle being in each one of a full set of all its possible positions. The known Forms began to be used illegitimately for purposes that had NOT been discovered. The method of searching through known Forms (wherever they had been initially extracted from) to fit new phenomena had now crossed a heretofore prohibited frontier.

The usual uses of such forms were now applied in a new way entirely, for which there was absolutely NO justification. Wave equations were used NOT to predict





SOLVAY CONFERENCE

positions, but to deliver probabilities of presence for all positions simultaneously. Absolutely NO justification for doing this was supplied. “It worked, so it was right!”, was the sole justification.

Now, up to this “revolution”, such tricks had been prohibited for very good reasons indeed. If a use could not also match meaningful explanations to be used in tandem with the formal encapsulation, then it had always been dismissed as entirely illegitimate.

Such things were always termed as “frigs”, and though they might give us certain predictions they could not help in developing a real theory – a concrete explanation of what was actually going on.

Now initially, this gigantic and perplexing “frig” was coped with by most scientists, expecting an imminent break through, which would finally and concretely supply an adequate explanation.

But not only did that situation fail to arrive, but a significant section of the scientists were all for dumping such required explanations as total self-kid, and pragmatically relying totally and exclusively upon the “equations that fit” as their sole means of dealing with Reality in the sub atomic area. They were tasting the delights of the knowledgeable technician, who could build a working amplifier, but could not tell you why it worked, and hence was incapable of designing something else from what was inherent in his construction.

*NOTE: Now a real scientist should have attempted to answer why this unexplained trick did work. It was obviously to do with situations where the overall can be addressed, though the contained and multiple particulars could not. There was a profound truth in there “somewhere”, so why did no one pursue it?*

*It was because of the existence simultaneously of the idealist notion of Law seen as determining Reality, rather than the materialist opposite that Reality determined all Laws. It had become common throughout science to ascribe qualities to laws as pre-existing driving essences. They MADE Reality what it was!*

*So when these “frigs” worked, they had confirmation that the Laws came first. You didn’t ask why there was Gravity- you just used Newton’s Law: it drove all bodies to behave as they did!*

*No one addressed the vital inverse – “Why did these Laws work? What was going on in such circumstances, so that overall predictions could be found and used?”*

The Copenhagen Interpretation of Quantum Theory was born out of the inadequacies of the majority of physicists, and it soon began to gain considerable ground.

By the Solvay Conference of 1927, Einstein, Schrödinger and company were confronted by Niels Bohr, Werner

Heisenberg and a phalanx of young “revolutionaries” who desired to totally dump explanation. And this group actually carried the day!

But, absolutely nothing was resolved by this “victory”: it was never a victory of Truth over Falsity. It was a victory of pragmatism and a very odd kind of philosophy, over the “old”, classical idea of Theory and Explanation.

*NOTE: Elsewhere this writer has dedicated a great deal of time and thought to the problem of Mathematical Chaos and the qualities of Iterative Formulae, which, in special circumstances, deliver more than can possibly be extracted from the usual type of deterministic equations.*

*In the solutions found in that work, there are significant resonances with the problems being addressed here. Once again overall features can be addressed by what seemed initially to be merely some sort of “frig”, but on close study turned out to be a method that could in special circumstances approach Reality more closely than our usual methods.*

*Clearly, at some point this author will bring both of these together – but not yet!*

Now, this dichotomy didn’t go away, but Einstein and his colleagues could not defeat the Copenhageners for a very good reason.

And this was that they too relied upon Mathematics and Form to a great degree, and with this identical assumed basis for their science, they were not equipped to come up with adequate answers.

Both sides had the same formal premises and hence there was nothing that the defeated side could bring in to overturn the defeat.

Einstein, for example, spent the rest of his life trying to unify Quantum phenomena with Gravity (and his own Theory of Relativity), and for exactly the reasons stated above, he was completely unable to deliver this.

Indeed, though that struggle has continued, being formally (mathematically) based, it could only continue finding and using ever more complex Forms, and attempting to match them to experimental data.

Parallel Universes and String Theory are precisely this! And the steadfast supporters of the New Physics began to look to “Philosophy” for support for their ideas (though you wonder what actual philosophers thought of their “offerings”, for they were uniformly dire from any standpoint).

For they found their ideal get out in the usual place for such pragmatists – in that special brand of agnostic/idealist philosophy typified by Kant, with his “unknowable Things-in-Themselves!”. The closely related positivism

of the Empirio Criticists, that Lenin had worked hard to demolish in his book, Materialism and Empirio Criticism, was resurrected (once again) as more true than the usual materialist standpoint, and it became the rule to talk of Wave/Particle Duality, wherein the infinite could become localised in a definite (if not precisely defined) place, while such a “particle” could suddenly become an infinite wave.

Swapping “mini” particles is brought in to “explain” forces of all kinds, and an ever growing Particle Zoo was claimed to be the long sought for determinist basis of everything in the Universe.

Now, though all my fellow students swallowed all this with evident pleasure (they were all very good at mathematics) for they delighted in the fact that Physics had condensed down into their favourite subject, and it seemed that it was their purely mathematical skills that would be needed to deal with absolutely everything in the New Physical World.

Needless to say, in spite of being an able mathematician myself, I did not join in their rejoicings.

Clearly Copenhagen was indeed a major retreat.

When faced with an irresolvable set of contradictions generated by their most basic and “untouchable” assumptions, these “scientists” proved incapable of delivering a significant, and necessary, revolutionary alternative, and instead had to easily and seamlessly extend their dearest love – that of Form, as the sole purpose of Science. Instead of going on to Theory, their “better” alternative would in future “terminate” at the fitting of Equations to Data, and delivering reliable predictions without any attempt at Explanation. Understanding – the defining objective of real Science had been dumped!

Now, of course, this retreat was no solution! It was an almighty “frig” and involved the embracing of dichotomy and contradiction as being due to an area of Reality “beyond our ken”, and hence legitimately brought under control by an ever growing number of equations, which were unavoidably both contradictory and mutually exclusive.

The skills involved became those of knowing which equation to use at which time. [Wherever have I seen that before?] At the last count there were at least 12 different models of atomic nuclei, and you had to know them all (and their equations), and, of course, when to use them

Such a position was bound to generate more and more contradictions, and the total lack of any real underlying and explanatory theory, became ever more confusing for the rest of humanity, even if the practitioners involved had learned to effectively juggle between the alternatives!

The glaring lack of any sort of narrative or commentary (let alone explanation) had somehow to be filled. But “on principle” (we were informed); it could not be in the “old” mistaken way.

So, what could these scientists do, and where could they look to find “acceptable” evidence. It could only be in one place – within their absolute essences of Reality – their extracted equations!

So, the new era in Physics involved scientists using their equations as the sole source for any sort of meaningful narrative.

But what on earth could they expect to find, when all ascribing of “old-fashioned” explanations were now totally banned?

Yet they began to find hidden “somethings” there within the formulae, and they could call them “particles”, for in the new era, that could include waves too, couldn’t it? And as this was the “unknowable World of the Sub Atomic”, they could ascribe meaningless properties to extractable entities, which though they didn’t mean anything concrete; they could certainly be shown to be ruled by formal relations.

Now, these narratives sounded awfully like explanations, but were about things ruled to be “beyond our conceptual capabilities”, yet encapsulatable in yet more formulae and laws.

Instead of Reality being the sole source and final arbiter of ALL legitimate data, it now became legitimate to fathom the Essences of Reality – the Equations, for things we could NOT find directly in Nature. All sorts of suggested entities, and even properties were speculatively extracted from equations alone, and a new equation-based speculative set of descriptions were increasingly developed to add some sort of unifying narrative to the Main Enormous Bag of Formulae that was their sole repository of Truth.

Indeed, these speculations increasingly divided sub atomic physicists of from the rest of Humanity, who usually hadn’t the faintest idea of what they were talking about, but at the same time could clearly see that these very strange folks could indeed get important results.

After all, it was these very same scientists who had devised and constructed both the devastating Atomic Bomb, and the even more destructive Hydrogen Bomb, and proved their validity BY USE!

It seemed to the uninitiated that the seemingly “way-out” speculations of these scientists did not prevent them from making such amazing things.



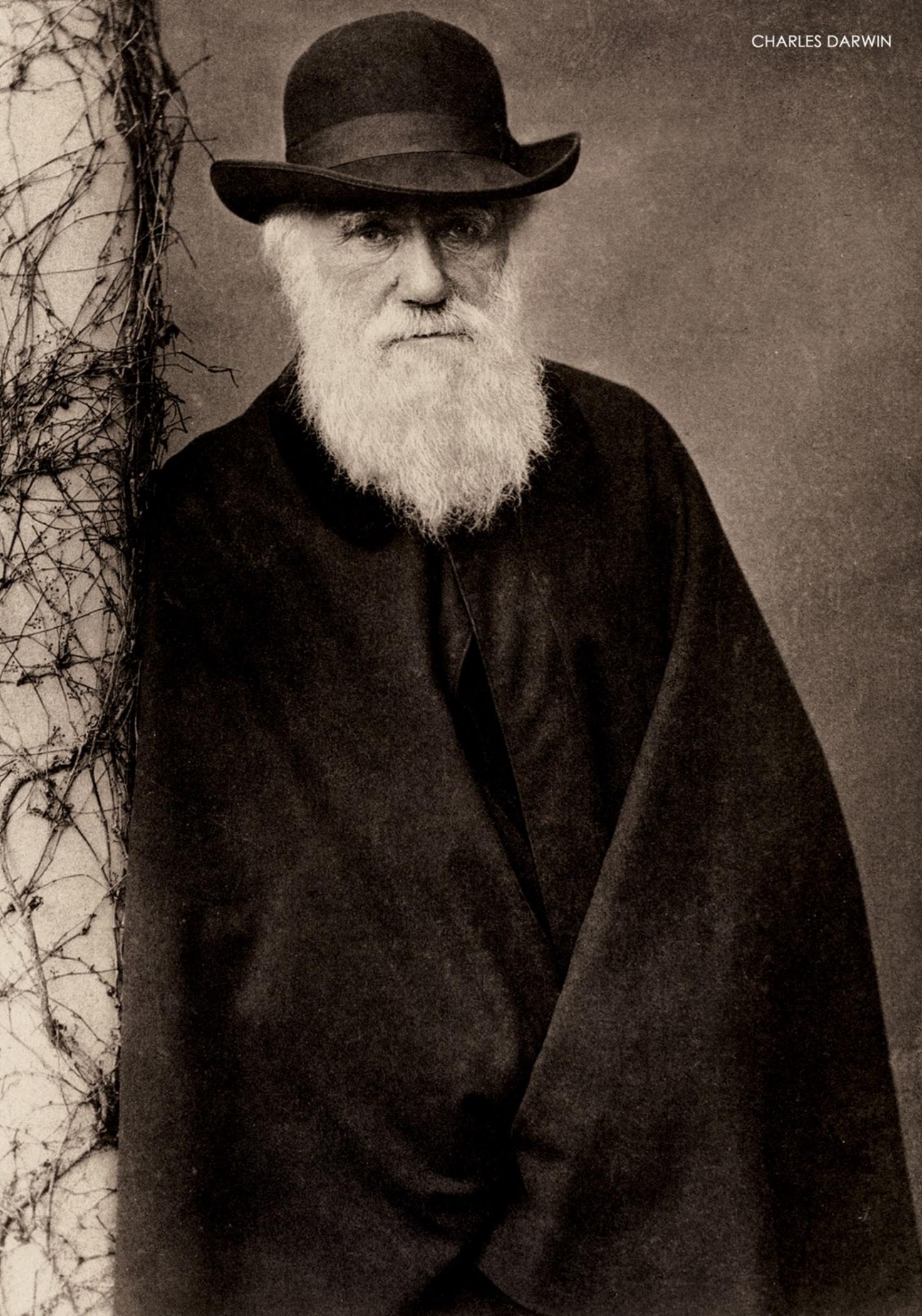
Kant



### Of Ideality and Reality

An interesting study of how equations are supposed to direct the phenomena of Reality is addressed by Wiles’s proof of **Fermat’s Last Theorem**. He did it by bringing together very diverse forms extracted from very different areas of Reality, and with these proved that Fermat had been correct.

But, the subject of this work was Number Theory – a totally abstract area existing entirely within **Ideality** - the World of Pure Form alone, so here his eclectic proof would be entirely legitimate. The point is that such methods would NOT be legitimate to prove something in concrete Reality.



But theirs was a very closed World!

It was now impossible to relate what they were doing in such crucial areas as Biology and Consciousness, and indeed a host of other important sciences.

But, nevertheless, these sub atomic physicists still claimed ultimate precedence! Physics was held up as the most basic of all the sciences, and was even termed a hard science in contrast to all the other and “definitely” consequent soft sciences. For when they finally revealed the full set of elementary particles, they confidently claimed that they would hold in their hands the absolute bases of absolutely Everything!

But it wasn’t even remotely true!

They had defined a very simple area, which they had entitled Physics, and assumed that it could be extrapolated downwards via “separable” Parts all the way down to the ultimate elementary components of Reality, then upwards to produce everything in the Universe. They were profoundly mistaken. They would never achieve that objective. It was impossible. The World is NOT made like that!

Whatever they found, it would never explain the Origin of Life, or its subsequent Evolution, though others, like Darwin, could and did address such areas. Their bases totally prevented them from such achievements.

But there were still existing scientists who did not subscribe to the Copenhagen/New Physics fiction: scientists who were still true to Theory and Explanation, and who could never avoid addressing almost constant Qualitative Change, and none of them were physicists! They were of course the derided soft scientists – the biologists and the geologists – the psychiatrists and the philosophers, and the studiers of all that stemmed from LIFE!

For a couple of hundred years they had been pursuing an understanding of Living things, and after Darwin, their Evolution. Qualitative Change was their stock in trade – they could not avoid the most dramatic and potential-filled developments.

Indeed, the monolith of Physics soon began to seem very small and limited compared to their enormous remit. They had to cover everything above a totally non-living Physics: they had to address developments on all fronts, and in the end, it became clear that even within the supposed aegis of Physics, developments had been inevitable there too.

Now, as soon as such Change was accepted, the question of the Emergence of the Entirely New had to be addressed.

While the physicists insisted that such were illusions, and were in fact mere complication, the real New Scientists were being unavoidably pushed to address the interludes

of significant Qualitative Change which were termed Emergences.

Now, these events of significant, creative change were not clearly evident for most of them occurred in rare, short period episodes surrounded by very long-lasting epochs of Stability, so not many of these crucial happenings were available for study in the classic scientific manner.

But, there was still absolutely incontrovertible evidence that they had happened, and were indeed the sole engines of real and transforming Qualitative Change.

The geologists could point to fossil evidence of Life in the rocks of the Earth, and also to those early layers entirely devoid of any traces of Life. Life has originated on Earth, and that crucial Event needed explanation.

Also, at the opposite extreme Hegel, the philosopher, had realised that such changes did indeed take place considerably more frequently, and indeed continued to do so now, in the ideas that arose in the *thinking* of human beings.

And even the physicists were getting evidence from the Heavens, of the actual births and deaths of Stars.

There could be very little doubt that not only was it necessary to research these Events, but that they could never be addressed by the methods totally embedded in, and dependant upon Stability as was Physics for example. A Science of Qualitative Change was required, and “*Stir thoroughly, and wait for equilibrium before taking any measurements!*”, would simply NOT suffice.

From sources a million miles from Physics, evidence of real, qualitative change had to be collected and interpreted, and clearly LIFE had to be the prime area for that.

Also, quite apart from assumptions such as Plurality and Reductionism, and, of course, the idea of the “rule” of Natural Law, which made sense in Stability, were nonsense in the midst of an Emergence, so the former had to be jettisoned and replaced in studying these crucial turnovers.

The prime candidate for rejection, which underpinned literally all of our science experiments, was, of course, the Principle of Plurality. It assumed that when we extensively and rigidly modified small locations in Reality, in order to reveal, extract and then abstract key relations, we were then holding in our hands one of the basic relations, which when all taken together added up to any recognised aspects of Reality.

The crucial basis of this belief was that the extracted Parts of any Whole that we were able to take out were separable – that is unchanged by their various different contexts! It just wasn’t true!

Laws don't make Reality: Reality makes laws!

Everything can be affected and changed by everything else: we don't get what we see by mere addition (complication alone). We had idealistically inverted Reality.

Totally disembodied "rules" were considered to be what made Reality what it was, and the purpose of Science was to extract these bases – the ultimately fundamental sources of everything that existed.

Of course, in doing this, we did find something: we had gradually developed a methodology that could farm sections of Reality in such a way as to produce a simple relation, but that was not what existed in totally unfettered Reality. Indeed, WE had effectively made what we extracted: it was a man-made product of our methodology, and certainly NOT what we endowed it with.

In truth Reality is entirely the other way round. Reality is not a sum of separable Parts (or indeed Laws) at all, but a generator of specific relations in specific circumstances. That is why we had to both set up the exact same Domains for both extraction and USE.

Now, the mistake was, of course, understandable, because whatever were contributing to a given situation, were not all of the same weight, and it has long been demonstrated in quite sophisticated emulations that there will always be a small number of produced dominant relations as well as many minor, simultaneous others too.

No Part was eternal: all were consequent! And even the dominant relations were different from our extractions. Our methods did not reveal essential relations; they instead merely created particular relations by our methods. Context was everything! The whole idea of "natural law" produced by these pluralist methods was a myth. Plurality had to go!

And this meant that a wholly new approach, philosophy and methodology was necessary, and should, somehow, concentrate not upon Stability, but, on the contrary, upon Qualitative Change!

Perhaps the major changes between the new, necessary approach and the classical, pluralist approach is best exemplified by Stanley Miller's famous Experiment investigating the Origin of Life on Earth via knowledge of the primaevial atmosphere and general climate and conditions of that planet.

He set up a "classic", yet holistic, experiment by hermetically sealing the known primaevial atmospheric gases along with water and sources of both heat and a means of distilling any atmospheric water vapour back into liquid. To complete everything that he could be sure was present at that time; he also included a means of producing electrical

discharges to bring in the known actions of lightning into the system.

The idea was to emulate the holistic simultaneous processes of a moving and cycling system, and he was able to set the totally isolated system into motion merely by the application of heat.

The atmospheric components moved via the rising heat and were added to be water vapour evaporated from a small residue of liquid water in the base, and elsewhere the action of the Still condensed the vapour (like primaevial rain) back into water in the bottom pool.

Miller left his system running with a small permanent supply of heat for a week then inspected the system to see what had happened. There had been no detailed monitoring, nor could there be, because the system was totally sealed. Whatever happened would be entirely due the gases and water present, with the processes of evaporation and distillation, thorough mixing and the occasional discharge of electricity.

Even on first glance, it was clear that something significant had most certainly occurred. The small pool of water in the base had turned red-brown!

Now this had not been expected. Thinking only in terms of individual possible processes, the result was a surprise. Clearly many both simultaneous and sequential processes had interacted using up what was available, but also producing new things. So, the environment in a holistic fashion had both continual changes and also allowed more and more things to occur.

An analysis of the red-brown liquid was shown to include several amino acids – the known building blocks of Living Matter.

So, let us be absolutely clear, this was NOT like the usual kind of experiment, which restricts conditions to the maximal extent, leaving only a couple or so active ingredients, so that their interactions and products could be clearly produced and identified.

This was instead a genuine holistic experiment, running entirely under its own natural simultaneous processes, with everything affecting everything else. It was a profoundly important experiment, and it said significant things about the sorts of things that could occur in entirely unfettered Reality.

Yet, it was considered to have been a mere gimmick. It led nowhere because no one could be sure what had occurred, and in which order, and what the various Phases must have been to produce the finally analysed result. It compared unfavourably with the usual kind of pluralist experiments, based upon tailor-made Domains, which

could thereafter be used as unitary and reproducible processes with predictable results.

Considered in terms of the usual methods of technology, Miller's holistic Experiment "was useless"!

Whereas competent engineers could set up and carry out sequences of pluralistic experiments, which as a coordinated set could be organised to produce complex and intended products, Miller's methods could "only" produce the same result each time, with no progress towards a final and useful outcome. Even Miller could not suggest any real developments, though he improved the basic form and ultimately produced more and more of the possible kinds of amino acids.

But both his hostile critics and Miller himself were wrong.

Indeed, methods are now clearly available for sampling such an ongoing system at regular time intervals throughout, without in any way interfering with the contained processes, and with a physically structured but inert directional internal system, that caused predictable routes through the arrangement, it is most certainly possible to deliver time-based sample sequences that could be externally analysed.

As Nobel Laureate Hunt has shown in his investigations into the developments of a living fertilised egg of a sea urchin, and using sequences of gel chromatography for his time-based samples, he was able to recognise the periodic production of cyclin, which plays a crucial role in cell division.

Using modern, sophisticated experimental methods, in carefully designed holistic experiments, the above techniques along with many others, could indeed deliver sufficient data for processes to be recognised, and tested out elsewhere in constrained, pluralistic experiments.

Not only did Miller create the first fully Holistic Experiment, but he also, despite the incorrect criticisms of most scientists, had also pointed the way to a whole Holistic Science Methodology.

Now, clearly the above evidence is only one valid route to be investigated to achieve a particular set of holistic methods, and, vitally, the consequent holistic theoretical developments too.

But there are many others, in a much richer range of phenomena than Physics alone could ever address. For while Physics is entirely about Stability, there are innumerable areas where Qualitative Changes are absolutely vital, and determine outcomes, and these range from Revolutions in Human Societies to Consciousness in the brains of living animals, and the crucial events first

adequately addressed by Charles Darwin in his Origin of Species.

Indeed, the writer of this paper had a series of objectives, which he considered absolutely vital if the New Science was to be established, which could address this vast area.

Initially, a great deal of work was undertaken by the author into **The Processes and Productions of Abstraction** (*overleaf*), which finally revealed a true parting of the ways between Science and Mathematics, wherein the latter supplied with various relations from experiments in Reality, was able to generalise/abstract them into widely applicable Forms, but in so doing had also removed them from their producing concrete context in Reality, and into a World of Pure Forms alone – The abstract World of Mathematics – Ideality!

This turned out to be crucial in defining the relations between Form and Content (or more correctly Concrete Context), and developing sound, and different, Philosophies for both Science and Mathematics.

In addition, the crucial episodic Events, wherein real, creative qualitative changes actually occurred and transformed situations systemically had also become evident, and had come to be termed Revolutions or, more generally, **Emergences**.

These had to be studied if Mankind was to address development and Evolution on a multitude of scales, for the methods of the past had, thus far, got nowhere near addressing any of them adequately.

The trouble was, and is, that this is easier said than done.

Prior gains had been predicated entirely upon turning away from such changes and concentrating exclusively upon what was relatively constant qualitatively, or could be made so.

The whole of Science has concentrated entirely upon Stability, while Mathematics dealt solely with eternal Forms. How on earth could the trajectories of Dynamic Qualitative Change be addressed by either of these approaches?



Attempting to answer this crucial question led the author into a long period of research into both Evolution of Living Things, and, of course, Social Revolutions. And the result, for this researcher, was his initial formulation of **The Theory of Emergences** (with obvious major credit to the genius of both Hegel and Marx, who pursued this same objective in a uniformly hostile World).

Now Theory can be, and very often is, sneered at by pragmatists. The very fact that they can find ways of accurately predicting future outcomes without any underlying theory, cause them to reject all such attempts at explanation as pure self-kid. But this was NOT the case in Science for centuries, though it began to dominate there too after the victory of the Copenhagen Interpretation of Quantum Theory at the Solvay Conference of 1927. But, of course, pragmatists in general and the Copenhageners in particular, were wrong on several vital counts.

For, though never perfect, all generally accepted theories, gain acceptance because they both contain Objective Content – which means aspects or fragments of the truth, and also explain things in a meaningful way, so that with such theories as a basis, the whole project can be extended in an informed way into ever more extended areas.

And the dismissive critics conveniently forget how revealing such theories are of the overall trajectories of Reality-in-development, and consequently how they correctly guide our choices of new areas to study, with a view at all times to integrate things into ever more coherent and comprehensive sets of theories. They also use but do not appreciate just how theories provide us with good (if not perfect) models and analogues to enable us to at least begin to grapple with wholly new areas.

Let's face it; Pragmatism is a head-down, retrospective and particular methodology, whereas Theory is a head-up, forward-looking and general methodology. Compare what theorists do with the rummaging through an enormous Bag of Forms to find a fit, and then immediately terminating attempts at explanation and instead merely fitting-up a general Form with experimentally gained data, as the revelation of the true driving essences of Reality.

Do not forget that is exactly what the Greeks did in polishing their Ptolemaic Theory of the Planets. It took a theorist to smash that fiction, and by putting the Sun at the centre was able to much more correctly explain our Solar System.

Theory reveals, whereas Form-fitting is merely retrospective, descriptive and totally uncreative. Compare Darwin's Origin of Species with the assumptions naturally derived from pure data, with absolutely no suggestions as to WHY things are the way that they appear.

While Darwin's opponents were convinced of the immutability and permanence of species, he not only recognised development, but also ultimately addressed the usual fate of almost all species – Extinction, and explained development with his Theory of Natural Selection. To be solely wedded to Forms, turns you into a technologist and NOT a scientist! To be a scientist, you must develop Theories for every new discovery: indeed Explanation is obligatory!

It must be strongly emphasized that Theory with demonstrated Objective Content gives vastly more Understanding of a situation than any equation. For it illumines, with rich resonances, all sorts of problems. Let me give a relevant example!

Based upon wide experience in many disciplines (and even artistic/creative areas) this author was finally able to deliver a Theory of Emergences, which encapsulated creative, qualitative changes into a described and explained trajectory between established, and essentially static, Stability, via a revolutionary Emergence, to deliver a wholly new stability at a higher Level. The spin off from this Theory countermanded many prejudices about such revolutions.

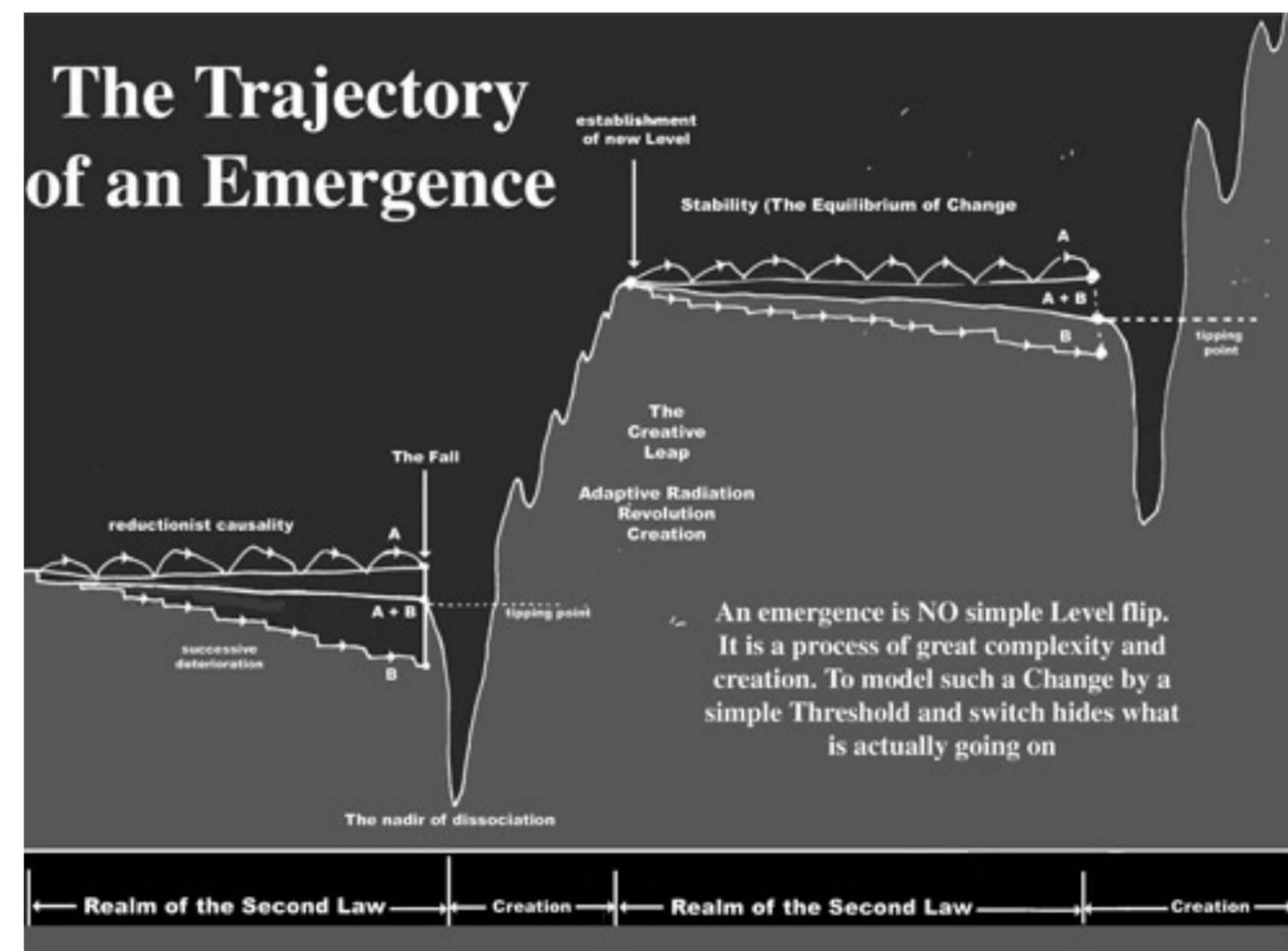
*NOTE: These and following points are helped by reference to the diagram The Trajectory of an Emergence >>*

First, it was clear that they were never precipitated by a nascent alternative. Indeed, such crises were always down to Second Law of Thermodynamics dissolutive processes. Every Stability generates its own demise!

Secondly, the result of such successful creations were never, as is usually supposed, wholly fruitful and full of easily changeable resultant situations, but indeed the exact opposite – very conservative situations opposed to absolutely all further changes of whatever kind.

Also the precursors of such significant Events were always dramatic oscillations, to and fro, between the former Stability and its seeming total dissolution. Indeed, the current day-by-day oscillations on the Stock Exchanges of the World (June 2012) are symptomatic of a major crisis in Capitalism, and all the short term and localised explanations that are usually given, are just so much window-dressing from those who depend upon Capitalism for their existence, dominance and wealth.

Indeed, though oscillations in the Third Phase of an Emergence (That involving the rising to a New Stability) had been a very early extraction from detailed knowledge of Revolutions - particularly in Michelet's excellent History of the French Revolution, and Leon Trotsky's remarkable effort on the Russian Revolution, the similar oscillations "on the way down" towards the Nadir of Dissolution, were a much later and vitally important addition as more evidence



clearly indicated that they played a significant role there too.

The sort of thinking required is significantly different from the usual forms in classical scientific analysis, pattern-matching and equation-making, for what is going on moves from phase to phase in rapid succession, and without the wherewithall to identify these rapid and significant changes, there could be no hope of keeping up with such situations in constant flux. Such episodes are the exact opposite of Stability, and don't even remain in a given phase long enough for it to be in any way captured and expressed as a law. The whole concept of a situation being built up by the addition of already known relations is meaningless in such turbulent circumstances. Even the greatest of classical scientists would be totally lost in attempting to reveal what was actually going on. Indeed, in talking about intervention in a revolution, Trotsky insisted on defining such capabilities as the Art of Insurrection.

Indeed, though the pluralist methods may hold fairly well in the short term and during equilibria of various types, over longer periods and most crucially, always, within an Emergent Event that approach is invariably wholly misleading and in fact useless.

The pluralist basis of there being entirely separable Parts is

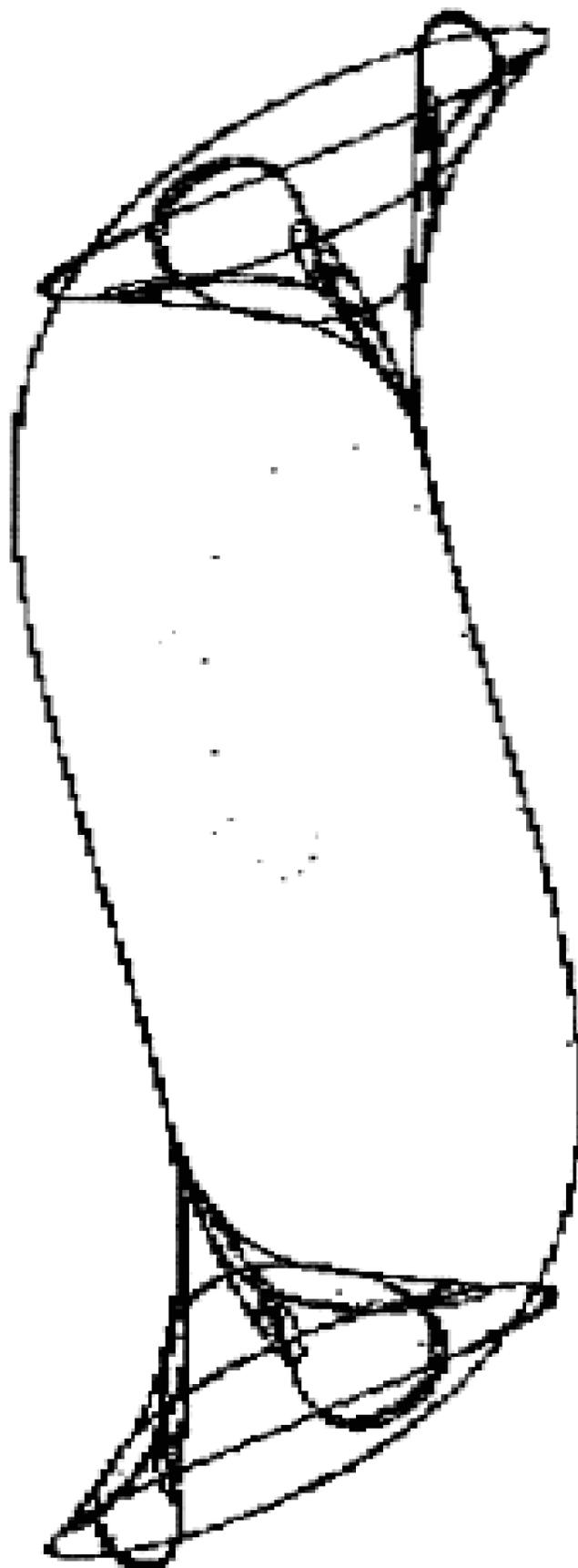
in error. The holistic mix does not at first glance seem that different from the pluralist alternative. But it most certainly is a wholly New and different System! The absolutely necessary natural stability, or the alternative constructed stability, is neither present nor arrangeable.

And all Laws occur only at the various different established Levels, and not in the torrent of change from one into the other. Very different Laws can arise in apparently very similar (but actually distinctly different) areas.

Pluralist scientists were all amazed at the major differences between the Planets of the Solar System, and their initial conceptions based upon the Goldilocks distance from the Sun, soon hit the buffers, when the Moons of Jupiter and Saturn were seen clearly for the first time. For these were in sets at the same distances from the Sun, yet turned out to be so amazingly different.

Their problem was their method - their whole way of prediction based upon eternal laws in a pluralistic way. Holism is never a simple sum!

The individual factors are neither wholly separable nor are they eternal. The cumulative complexity (usually assumed) must be replaced by everything affecting everything else



so that what finally emerges, at any particular time and place, will always, via multiple and varying thresholds, pursue a constantly changing path, while also producing temporary dominances, both of interrelationships and of consequent overall Forms.

Analysis is an invention of Mankind based on assumptions, which sometimes approximate to the truth, and in those cases provide an easy method of revealing more of what is going on. But it is always, and indeed only, applied in clearly conducive circumstances, or much more frequently in very carefully constructed and maintained Domains.

As soon as we allow totally unconstrained Reality, especially if the conditions are highly conducive to a large number of differing and even contending factors and their processes and relations, then they are inevitably susceptible to constant change, and our principles of analysis fail!

For Analysis is totally predicated upon Plurality – the production of Wholes via their multiple and necessarily separable Parts.

The development of Science, and particularly Physics, was based entirely upon such usual assumptions, conceptions and Domains of what we call a Stable Reality – whether naturally so, or maintained as such by Man’s own powerful and constraining arrangements.

Such “farmed plots” were absolutely essential in the majority of cases.

Equations, though generally applicable, must always be both revealed and applied in specially constrained Domains. They do not continue to apply beyond the boundaries of those defined regions. And while still well within them, but approaching the edges of validity, a kind of much looser Stability holds, which we term “turbulence”, or more correctly in the ways we normally investigate it, Mathematical Chaos. No equation, however, can carry us beyond its final boundaries of applicability. And the various efforts at Compound Forms with built-in thresholds to negate a prior Form for a newly appropriate one, are merely pragmatic, retrospective frigs, and absolutely nothing to do with the actual real and causal transitions.

<< FIGURE: Chaotic Fibrillations of the Heart

A wholly new approach is imperative if Man is to address Reality in Change – to finally tackle Emergences!

For clearly hiding within the melee of a dissociation of one dominant relation is an entirely causal emergence of a different dominance, which once, at some time in the past, have appeared for the very first time ever, and thus was then a true Emergence.

Such a transformation will have arisen out of a mix of processes, which do not merely add together in a pluralist way, but genuinely and causally emerge in a seething mix of both contending and conducive elements, and are Truly

Naturally Selected (see the paper by this author with this title) to give a series of temporary dominances, but which, by their own productions can both undermine their own continuing dominance, and support the growing influence of others.

In addition, such trajectories go beyond individual processes to produce higher-Level proto-systems, and even the inclusions within the latter of aggressive/protective spoilers of any non-dominant, system-type of opposition.

Now, this has been developed into a coherent and meaningful Theory – **The Theory of Emergences** – by this author, but, of course, it is still NOT the Final and Absolute Truth.

It adds a new collection of Objective Content-type elements, and because of these, it supercedes all prior pluralistic alternatives. But, it will certainly be replaced by something better in the future. I both expect it and welcome it! But that will most certainly necessitate detailed research into such transformations – impossible by those still wedded indissolubly to Plurality.

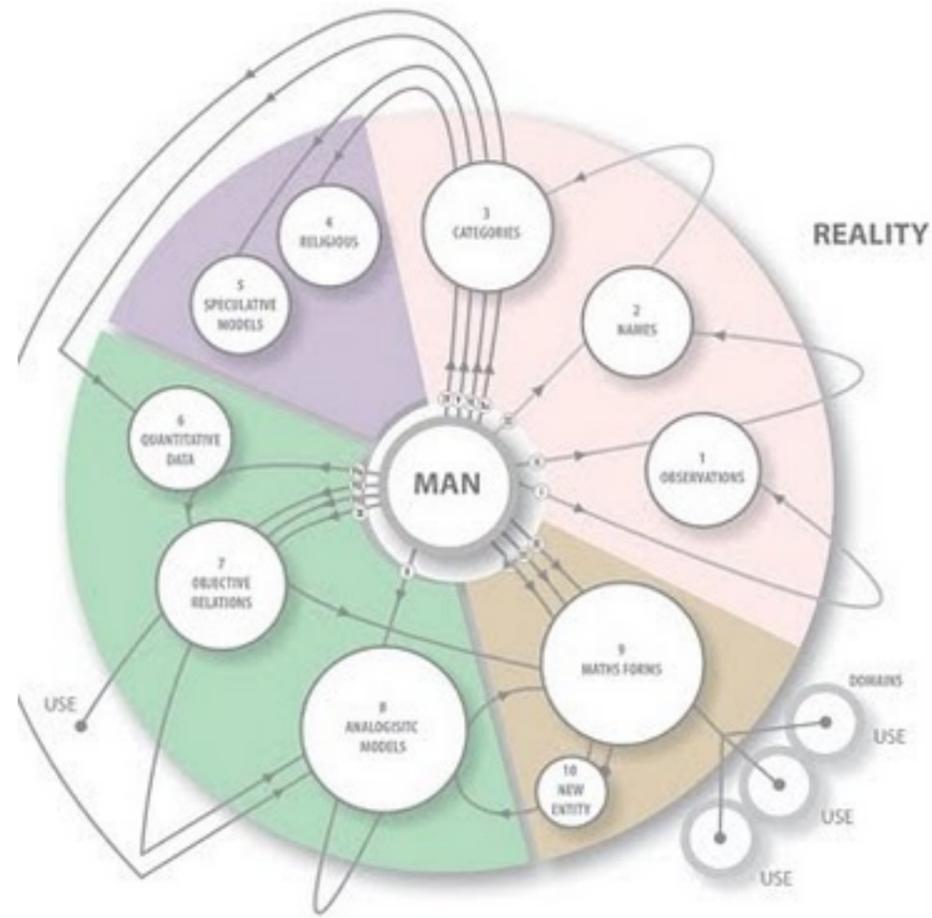
Now clearly, all this will be disputed! But it must be made clear that these ideas are the work of a scientist, who is also a sculptor and a musician – who rapidly widened his range over many years to include Biology, Mathematics, Philosophy and even Dance.

*[This latter work with Dr. Jacqueline Smith-Autard has led to a BIVA Award and 12 world-class Multimedia published Aids, and many “freebies”, for use by Dance Teachers, all of which are currently in users’ hands in over 80 countries.]*

And though initially, he has also written papers on all of these areas of research, those contributions were few and far between. But from 2006 to the present time (June 2012), he has been a full time philosopher/writer and also contributed an extended series of theoretical papers in Sub Atomic Physics, Philosophy, Dance, Mathematics and Evolutionary Biology. And some of these can be illustrated by his many explanatory diagrams (which have been collected into an extended work with the title **A Structure of Diagrams**).

Perhaps a few should be included here...

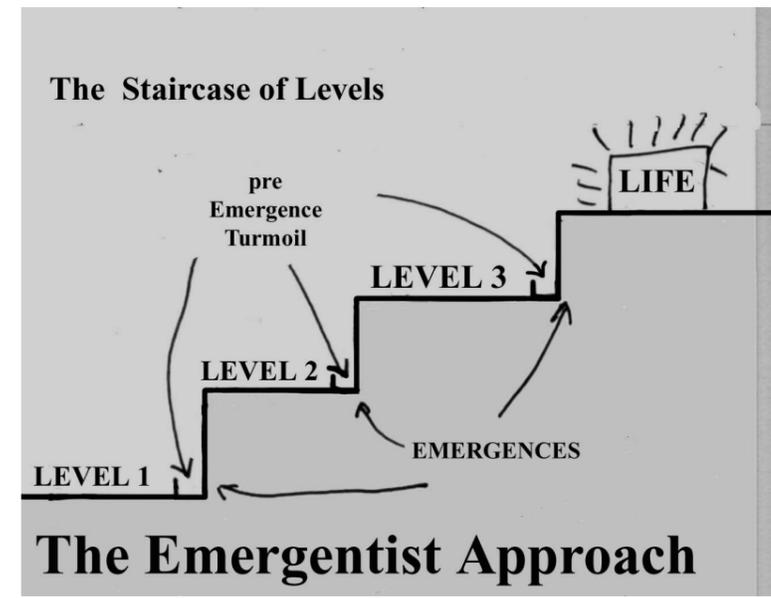
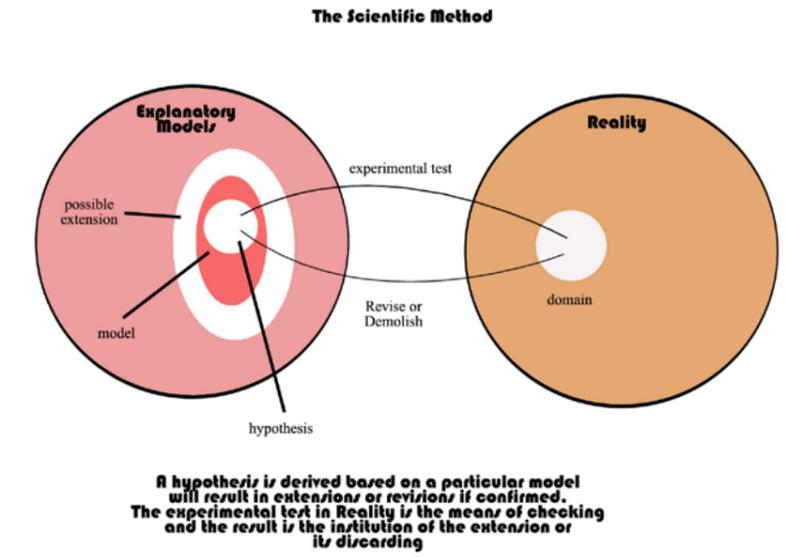
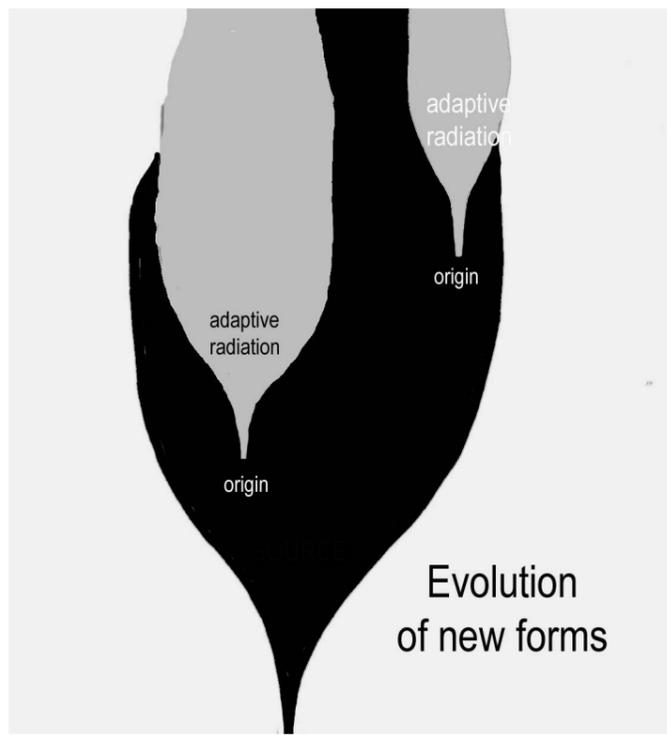
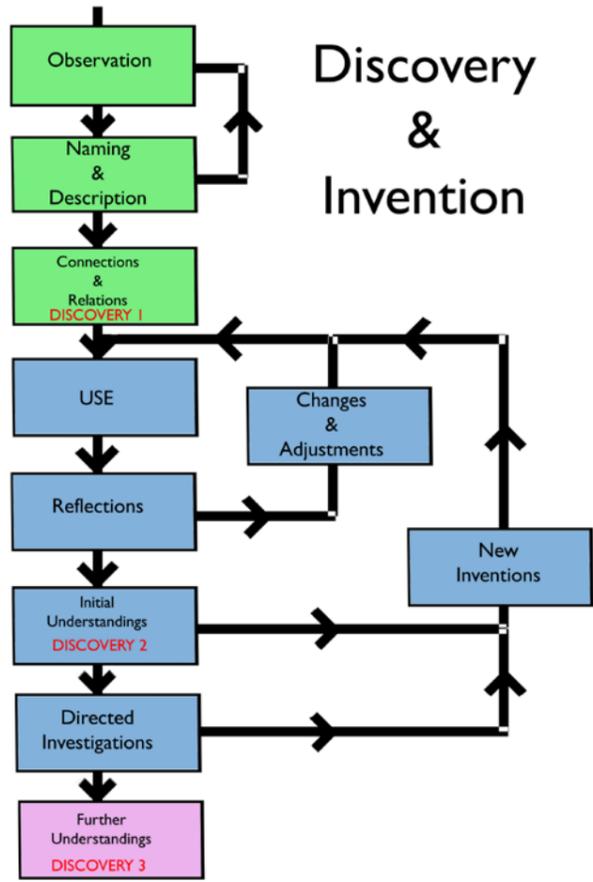
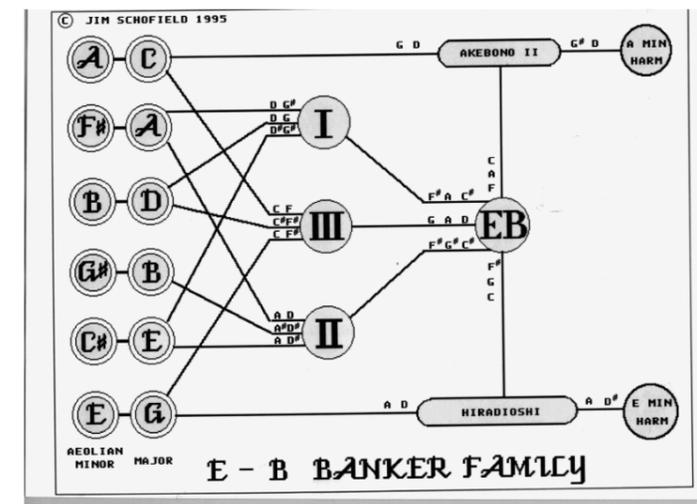
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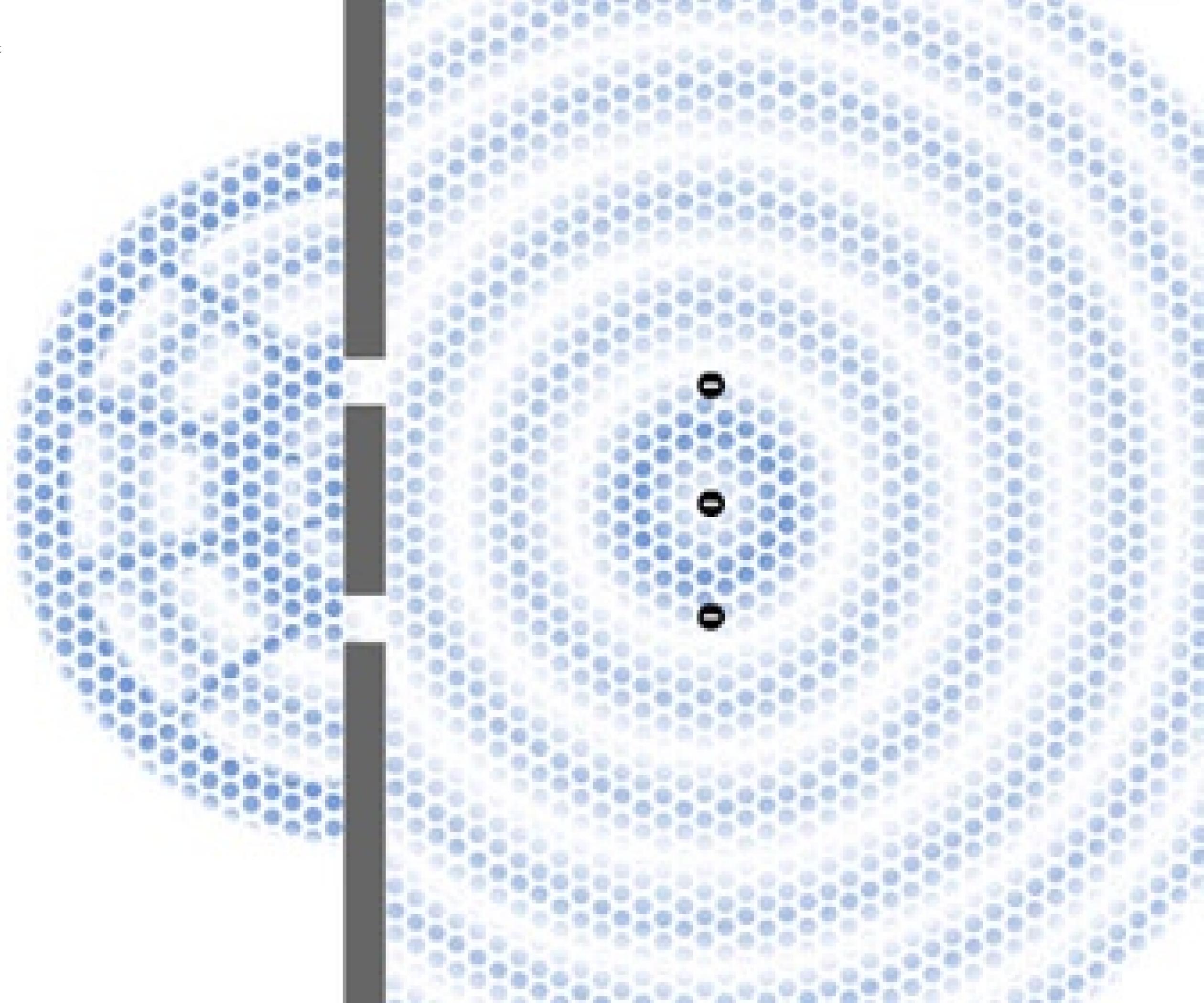


Other produced images in Music may reveal some of his rather more surprising researches.

NAME COAST IS CALM 1 2 3 4 5 6 7 8

© Jim Schofield 1992





The point of this latter excursion is to demonstrate the width of the author's work via a series of telling original images. The surprising thing about this width of serious areas of work must surely be the spin-offs from, say, Research in Dance Movements to Philosophy, where a crucial study of movement analysis on video and film, led to a critique of analogue versus digital video, and the development of new techniques which used the continuous dynamics of real movement (captured, it must be admitted, in a distorted way by analogue video methods, which perhaps surprisingly delivered enough for the eye-brain system to decode and extract much more than was possible from digital full-frame-at-a-time capture and delivery methods.. But, to deliver the absolute maximum these dynamic elements were combined with the added accuracy of precision stills, and the overlaying of simplified animated pathways on top of, and synchronised to, a moving underlying video, with full control and even synchronised multiple views when required.

When such “tricks” work, the philosopher has to ask, “Why?” and indeed answer it too!

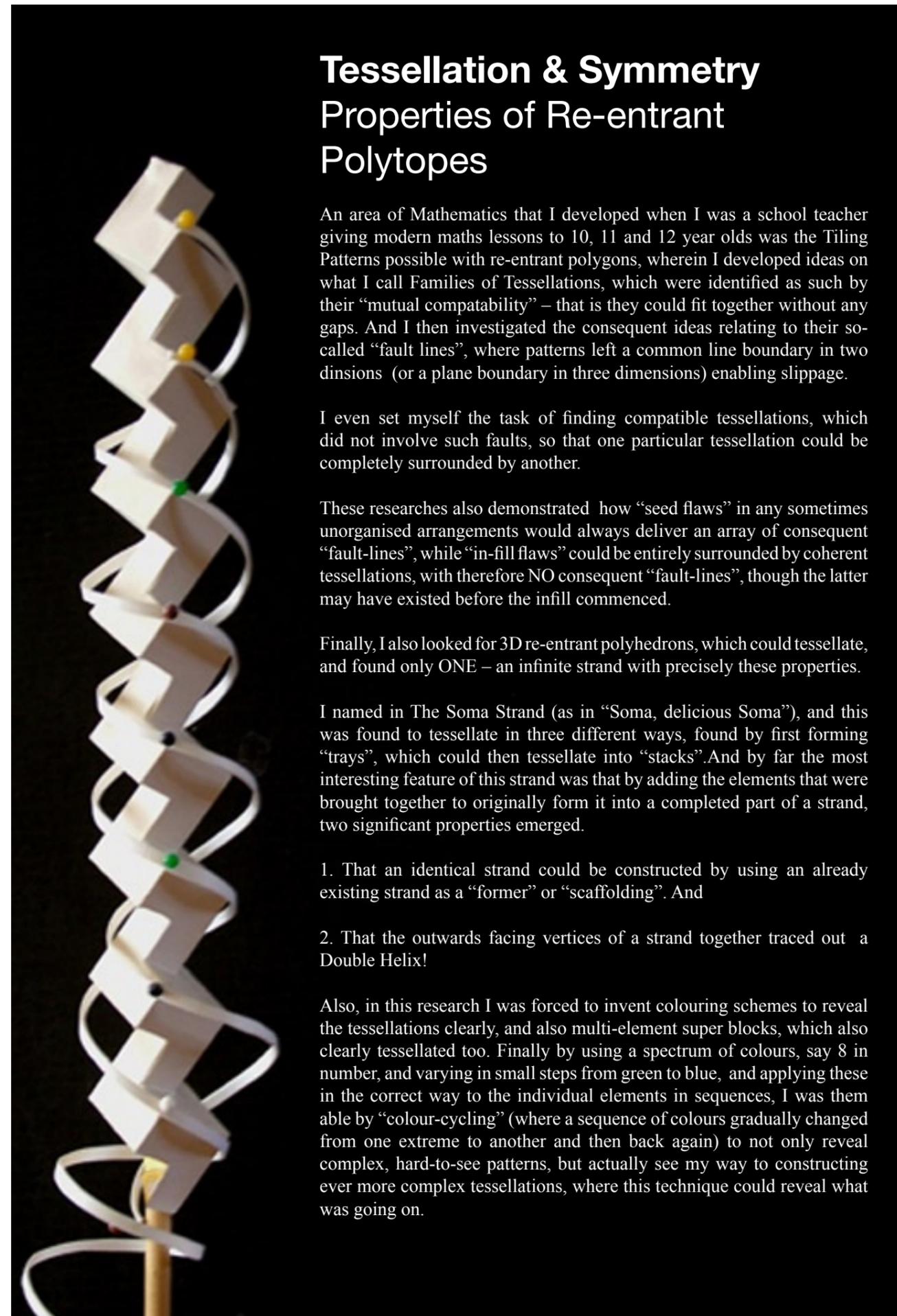
This researcher also spent a decade serving other researchers in Higher Education establishments in several countries, where his task was to wed appropriate computer programming and computer control to their various experiments, where he was able to make a telling contribution by subordinating his contributions entirely to the objectives of the primary researchers, and seeing his task as to serve those objectives totally.

The results obtained were invariably valuable to the primary researchers. And for this particular specialist expert, not only did his skill and understanding in his own discipline develop considerably, but he also, and much more importantly, developed the essential rules for valuable inter disciplinary cooperation in such researches. Frankly, most computer specialists take over the research they are supposed to serve, and invariably turn it into a development in their own area primarily – to the detriment of the primary researches original objectives.

Some idea of this interlude's projects will demonstrate just how wide they were.

1. The Computerisation of a Gas-Liquid Chromatograph, to facilitate biological researches by Neil Bulleid.
2. The control of an engineering test rig to aid Road Oil Tanker design. With Sandy Stephens
3. The means to capture and analyse data in research into the efficiency of the crystalline lens of a mammalian eye.
4. A tailor-made system to aid in the construction of an initial taxonomy for Tardigrades (Water Bears)

5. Help with designs for Hospital Care Plans of patients for the use of nurses in Dundee Ninewells Hospital
6. The design and building of a research computer for use in Music – Tango 81
7. A computer software Aid for Chess Players to record and access related Chess Games for demonstration and modification.
8. The design and Building of a Sequencer/Synthesizer for composing and playing real-time electronic music.
9. The Design and Building of a Computer system for both testing and analysing Colour Blindness using the 100 Hue Test.
10. A system for generating effective sinusoidal Contest Sensitivity Panels for Ophthalmics use, without the usual artefacts.
11. The authoring of teaching manuals for Third Year Degree Students using advanced graphics in their final research assignments using the DEC Minc Graphics device.
12. Design of the Laban Pure Form polyhedron to aid Dance students with Rudolf Laban's 26 spatial orientations, and his sequences and movement scales, plus, of course, his world-renowned notation system – Labanotation ( see Panel below).
13. The development of the Shell Theory of an expanding Universe.
14. The idea of the Paving of our Universe & Totally Internal Reflections at its boundaries.
15. A book on Model Based Application Packages (in particular how to develop such software for both Linear Programming and Critical Path Analysis.
16. A Chapter written for and published in the IBM Research and Academic Users' Guide No. 2 on the creation and modification of dichotomous Tree programs.
17. Pilot Study with produced Multimedia Resources based upon White Bird Featherless by the Siobhan Davies Dance Company – presented at the South Bank Centre in London, England
18. Joint Paper with Ghaffar Pourazar (now in Beijing with the Peking Opera) on the unification of video and animation of Dance Movement at the Compugraphics Conference in Lisbon Portugal 1992



## Tessellation & Symmetry Properties of Re-entrant Polytopes

An area of Mathematics that I developed when I was a school teacher giving modern maths lessons to 10, 11 and 12 year olds was the Tiling Patterns possible with re-entrant polygons, wherein I developed ideas on what I call Families of Tessellations, which were identified as such by their “mutual compatability” – that is they could fit together without any gaps. And I then investigated the consequent ideas relating to their so-called “fault lines”, where patterns left a common line boundary in two dinstions (or a plane boundary in three dimensions) enabling slippage.

I even set myself the task of finding compatible tessellations, which did not involve such faults, so that one particular tessellation could be completely surrounded by another.

These researches also demonstrated how “seed flaws” in any sometimes unorganised arrangements would always deliver an array of consequent “fault-lines”, while “in-fill flaws” could be entirely surrounded by coherent tessellations, with therefore NO consequent “fault-lines”, though the latter may have existed before the infill commenced.

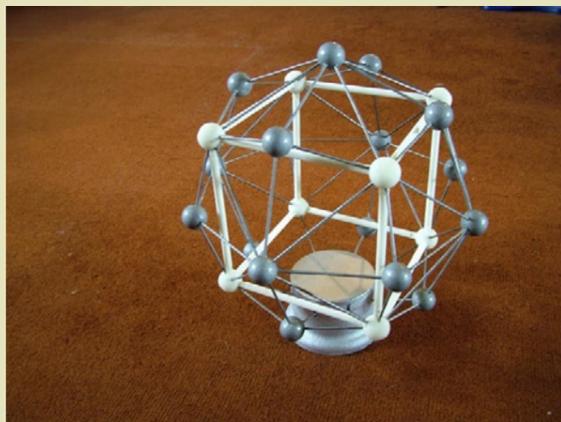
Finally, I also looked for 3D re-entrant polyhedrons, which could tessellate, and found only ONE – an infinite strand with precisely these properties.

I named in The Soma Strand (as in “Soma, delicious Soma”), and this was found to tessellate in three different ways, found by first forming “trays”, which could then tessellate into “stacks”. And by far the most interesting feature of this strand was that by adding the elements that were brought together to originally form it into a completed part of a strand, two significant properties emerged.

1. That an identical strand could be constructed by using an already existing strand as a “former” or “scaffolding”. And
2. That the outwards facing vertices of a strand together traced out a Double Helix!

Also, in this research I was forced to invent colouring schemes to reveal the tessellations clearly, and also multi-element super blocks, which also clearly tessellated too. Finally by using a spectrum of colours, say 8 in number, and varying in small steps from green to blue, and applying these in the correct way to the individual elements in sequences, I was them able by “colour-cycling” (where a sequence of colours gradually changed from one extreme to another and then back again) to not only reveal complex, hard-to-see patterns, but actually see my way to constructing ever more complex tessellations, where this technique could reveal what was going on.

## Rudolf Laban's Orientation System for Dance



Another interesting area of research arose out of the work of Rudolf Laban. This was significant because his 26 orientations surrounding the performing dance gave a dancer-based relative system for describing directional movements to the performer in the choreography that was attempting to be implemented. Indeed, these orientations were even the basis for Laban's own world-renowned Labanotation system for notating choreographic sequences to record a dance composition. He also, from a composition point of view, established various kinds of movement sequences, motifs (or "phrases") and even what he termed as Movement Scales, and valuable "Movement Exercises". And these are used all over the world in Dance Education.

He was aware that some three dimensional figure or polyhedron might well be invaluable to refer to in establishing these reference directions, and particularly what he called his Primary, Secondary and Tertiary directions as these had different symmetry properties AND allowed an intuitive framework for the whole system.

But try as he might he could not alight upon a single form to do this. But taking each of the three groups of directions separately he did find ideal forms for each. He was able to use the Cube, the octahedron and the cuboctahedron for his three sets. But clearly, he really required a SINGLE form to cover all possible movement sequences. Help from mathematicians resulted in the use of the icosahedron, which delivered 12 of the 26 directions, but they were inaccurate, and did not match his intuitively based system.. This figure also imposed an unnatural 5-point symmetry on all possible transitions possible with such a figure. Research by this writer immediately noted that in the actual 26 Laban directions there were three different symmetries involved for the three groups of directions.

Indeed, these orientations involved 2-point, 3-point and 4-point symmetries, and any choreographic movements could exploit these in various creative ways. It was thus imperative that a single figure with identical faces and 26 vertices to clearly indicate the required directions was necessary. And, after quite a bit of work, such a polyhedron was indeed finally constructed. Interestingly, all its faces were identical scalene triangles (3 different length sides), and all the vertices were exactly where Laban wanted them to be.

The author then constructed models using cardboard and glue, and from these was able to use a 3D Graphics Package to accurately construct the form on a computer, and from it generate all coordinates for a physical construction. The details were given to an engineering colleague along with designs for three desk top models – all using the full polyhedron using balls and sticks, but with but in addition adding differently coloured rods to pick out the primary, secondary and tertiary subsets, with a different model for each. These could be used by Dance teachers to help to discuss the various orientations and sequences of movement when limited to a particular subset and its symmetry properties. The author then immediately realised that a 10 foot diameter version, with a small included floor at the base, would enable a dancer to get inside the structure, and by reading the names of the orientations that were displayed on the inner surfaces of the vertex balls, could try out and record various choreographic sequences.

By also making the polyhedron glazed with a special access door that maintained the figure without distortion, it could be weather-proofed for external erection, and observable by a sizeable group of other students looking in from the outside. The aid was by now becoming extremely useful and a successful demonstration was put on at a UNESCO Dance Conference in Athens in 2006.

The author named his figure the Laban Pure Form in honour of the contributions of Rudolf Laban.

19. Pilot Study of Third Year Degree Dance students' choreographic assignments funded by the PALATINE organisation, producing an example Multimedia Disc to demonstrate the role of how such materials could be used by Dance Departments worldwide.

20. The following Multimedia Packs were subsequently sold worldwide:

- a. The Dance Disc – delivering pedagogically useful video materials for a piece used in GCSE Dance Test Examination in 1989
- b. The Wild Child
- c. Martha Graham Exercises
- d. Motifs For a Solo Dancer
- e. Choreographic Outcomes
- f. Bedford Interactive Publicity DVD
- g. Vocalise
- h. Step Dance
- i. Motifs for a Solo Dance (Mac)
- j. Choreographic Outcomes (Mac)
- k. Vocalise (Mac)
- l. ForMotion
- m. Archiving Software for Dance Companies (in development)

It should also be mentioned that the author and Dr. Jacqueline Smith-Autard had obtained over a long period of research, development and production as our partnership – Bedford Interactive, over £200,000 in grants from:-

The Arts Council  
The Foundation for Sport and the Arts  
The Television Fund  
Digital Equipment Corporation  
The Gulbenkian Foundation  
Ex-Students association of Bedford College  
and several generous Local Authorities.

Clearly, all this must surely, by now be pointing towards what needs to be done to transcend the impasse produced by a wholly stability-based, and pluralist determined science, to a new approach attuned to the real holistic nature of Reality, and its interludes of significant qualitative change – the Emergences. The no-go areas, such as the Origin of Life on Earth, and frankly all other such transcending events including all those concerned with creative development in Living Things, and particularly in such areas as Consciousness and Society. For example the pragmatist, when considering Society, "wants to know" how it behaves, so he can intervene to gain an advantage. He doesn't know, and doesn't want to know, why things happen the way that they do. But notice, that if the causes of such things were successfully revealed, then instead of seeking merely a personal advantage as with the pragmatist, it would become possible to intervene when appropriate to ensure the success of Emergent Events and actually accelerate progress.

As can be seen, this volume and width of contributions should establish the credentials of the writer, but in addition since 2006, he has been exclusively involved full time, as a philosopher and writer, and since 2009 as the sole contributor to his own SHAPE Journal, SHAPE Blog and SHAPE Account on YouTube, where he has published over 150 papers, 4 video/animations on YouTube, and 104 Posts on the Blog which have mainly been concerned with Science and Philosophy. And, though it wasn't his original intention all this work has increasingly become a preparation for the writer's forthcoming book defining Holistic Science, which will extend the usual areas addressed by Science from strictly stable phenomena, to the crucial episodes of significant Qualitative Change, which we term Emergences.

And in parallel with the above published work, this major future publication already consists of some 235,000 words, as a diverse collection of individual papers written with various quite limited objectives, but which have increasingly shown themselves to be importantly related, but will quite definitely require substantial additions and amendments to produce of coherent and comprehensive whole.



## Truly Natural Selection

Perhaps one of the most important contributions to ideas of development was what I came to term **Truly Natural Selection**, which extrapolated Darwin's Natural Selection backwards into non living systems, and the "competition between simultaneously acting processes, involving both the consumption of resources, and the generation of consequent products.

Such active systems would invariably transform their own bases, and rampant positive feedback situations would always dwindle as necessary resources were used up, while other processes could accelerate due to the adequate production of their resources by other processes. Now, apart from such relatively independent processes, there will always be other relations between simultaneous processes, all the way from necessary sequences of dependant processes to either mutually-supporting, conducive processes, and at the opposite extreme mutually-contending and opposing processes.

So, even in such non living mixes, the processes would directly effect one another and a kind of competition would most certainly ensue.

And along with these, there would also invariably be the ever-present, one-way, Second Law of Thermodynamics type processes which would seemingly prosper on a wide range of products and effectively parasitically benefit from all available productive processes.

These ideas in a totally holist way were developed to extend concepts originally thought to be confined only to the Evolution of Life, first to its actual Origin, and thereafter to the whole spectrum of developments that have occurred ever since the start of the Universe. And such ideas finally became a cornerstone of the **Theory of Emergences**.

## The Parting of the Ways: Postscript

Now, I feel that I would like to close this extended discussion with one of the most spectacular pieces of Mathematics in recent history. It concerns the problem of Fermat's Last Theorem, which he is said to have mentioned as a few words squeezed into the margin on a page of a book.

The subject of his note was to the effect that he had solved the problem of whether Pythagoras –  $x^2 + y^2 = z^2$  for certain integers could be extended to  $x^n + y^n = z^n$  for values of  $n$  other than 2. The English mathematician Wiles did indeed finally complete a very complex yet complete proof, but his method was remarkable.

He did it by including multiple exotic methods that had been extracted from very different and unrelated investigations into real phenomena, in widely separated parts of the World.. And with these he did indeed manage to weave a sound multi-part proof, which confirmed the assertion by Fermat.

Now, initially, as a scientist I felt that his eclectic method was untenable, and if he had been applying it to a phenomenon in concrete Reality, my standpoint would most certainly have been correct. But he wasn't doing that! He was applying his method to a problem in Number Theory –which is the most certain area existing solely within Ideality – the world of Pure Form alone. And as such he could with justice do what he did.

If a proof was needed that Mathematics resides solely in Ideality, while it is Science that deals with Reality, you could have no more succinct and final proof that such is the case.

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