SPECIAL ISSUE 46 NOV 16 JIM SCHOFIELD

SHAPEJOURNAL

COMPUTERISED SOLUTIONS

The Nature of Mathematics
The Necessary
Revolution in Philosophy

Words **Jim Schofield**
Design **Mick Schofield**

www.e-journal.org.uk/shape

Computerised Solutions, The Nature of Mathematics & The Necessary Revolution in Philosophy

Special Issue 46 / November 2016

The Myth of the Intelligent Computer

With so many media fairytales about so-called "Intelligent Computers", projected with confidence, by seemingly all pundits, into all our futures, we must, from a both well-informed and sound position, trounce such hopeful or even fearful myths completely.

They play no useful role whatsoever!

As an extensively-experienced expert in Computer Science, who, in particular, has concentrated upon inter-disciplinary applications (mostly in Higher Education, in Hong Kong, Glasgow and London, which finally earned the writer the post of Director of Information Technology, within the University of London, as well as being a winner of a BIVA award), I feel that I am amply qualified to dismiss the myths, while revealing what important gains have been, and are still being made in important areas, a million miles from the Fairy Tales tht predominate.

Futurising is always an ever-present disease of reporters, who don't really understand what they are reporting about, so a futurising myth or two can put them upon reasonably safe, currently-indisputeable, yet entertaining ground.

And, such myths then get wide publicity, and even form the conceptions of other non-experts, who have no alternative means of knowing what is being developed, other than such myth-making TV programme or newspaper-article constructors.

The statement, "The computer says…" is, of course, total nonsense, as all computer programs are written by people, AND, crucially, limits the means they use to considerably more restricted methods, than can be carried out in the best of Human Thinking.

Indeed, they are mostly iterative techniques for getting closer and closer to a sought, quantitatuve solution. Their value is that they can carry out such processes at colossal speeds, delivering useable results very quickly indeed.

But computers cannot think!

They are calculators, and all the brilliance put into a computer program is entirely the result of the thinking of the designer and/or programmer. I know all this because I have spent 35 years doing precisely that.

Clearly, the computer cannot reason as a human being can, and any reasoning processes it has are limited to what can be turned into a computer algorithm, what we call Formal Logic – only a subset of what humans can and do employ in Thinking!

Such puzzle-solving by iterative means cannot ever produce anything entirely new, that aspect of human thinking is entirely absent, and this is proved by the emphasis in the development of new drugs for medical use. The research takes place within commercial pharmaceutical organisation, which consider only the "solving of problems" by the prescribing of new drugs. Discoveries in how things function in the human body are processed in one way alone. "Will the new information suggest what drug will, or might, be an appropriate treatment?".

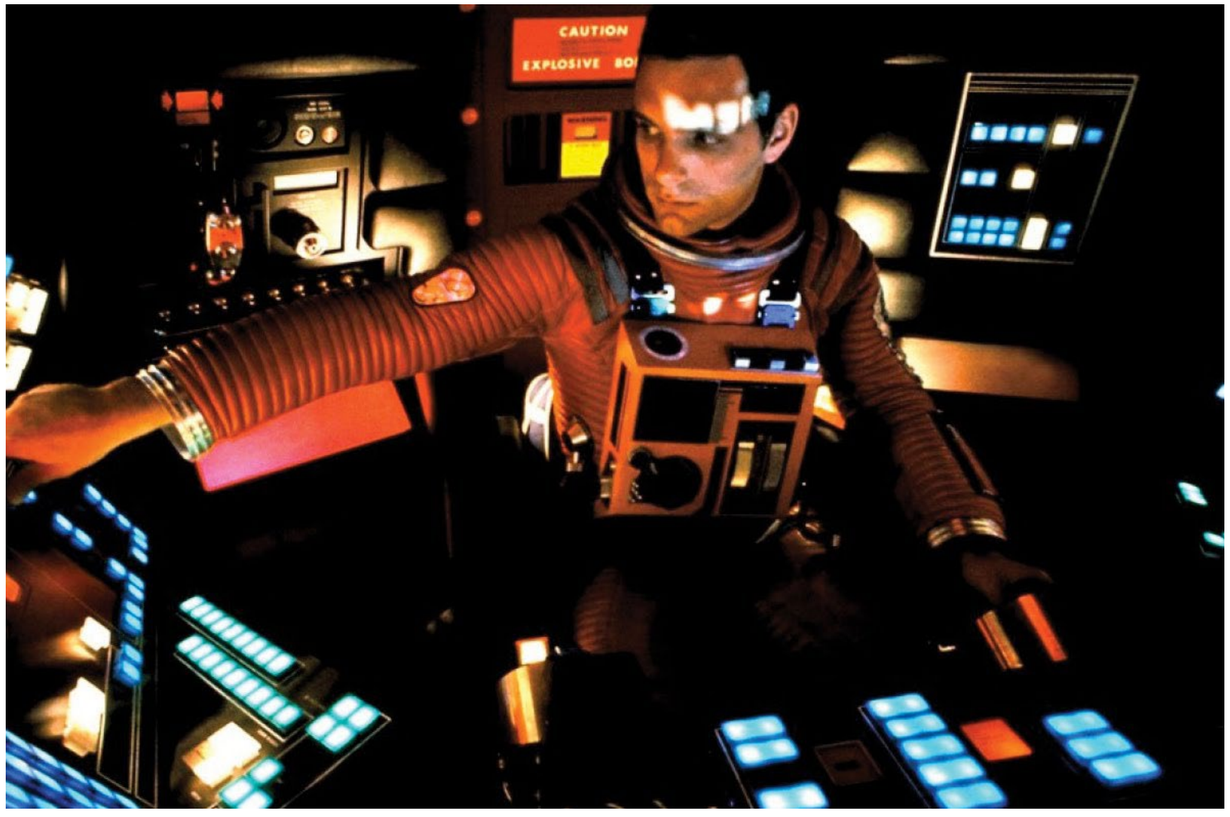
Medicine grows by means of new drugs or technological treatments. These are brought in if they can in any way inhibit the progress of the problem, or, indeed, kill the infection involved.

It is still wedded to pluralist ideas and methods, much like the rest of Science. Alternatives allocated with only microscopic funding are condemned as myths, so no alternative approaches get beyond ancient treatments, and rarely have anything to offer. Medicine today primarily deals with fixed laws, and uses fixed laws in all its processing.

What drugs and treatments that are prescribed for you are, all too frequently, suck-it-and-see experiments, or even a different mix-and-match alternative.

Now, the inadequacies of the stance and methods employed across the board, have been apparent from the initial appearance of Pluralistic Science some 2,500 years ago by the Ancient Greeks, and its crucial contradictions, were revealed, even then, by Zeno of Elea with his famous

All illustrations from Stanley Kubrick's 2001: A Space Odyssey (1969)



Paradoxes. In fact, Zeno's revealing of one contradictory pair of concepts, namely Continuity and Descreteness, are still, to this day, entirely appropriate, not only in the possibilities in using computers, but also in disciplines like Sub Atomic Physics with Wave/Particle Duality.

As always, Mankind is very good at finding usable, if contradictory, ideas and techniques, and exploiting such things to the full, without worrying about the theoretical contradictions involved.

Yet, at the very same time, in India, the revered spiritual leader – The Buddha, was taking a very different route, which embraced Change as both crucial and unavoidable throughout all of Reality.

He knew that you could not reduce Reality solely down to fixed, indeed eternal, Laws. And, his adopted stance, termed Holism, was the exact opposite of what had been adopted in Greece. For there, in India, to validate Fixed Laws and Formal Logic (and their basis – the opposing Principle of Plurality) was unthinkable in the culture of India at that time.

Yet, not only in Ancient Greece, but literally everywhere since, in the West, those premises were established and remain as the philosophical basis right through to the present time.

Indeed, all the gains of Mathematics, Science and Philosophy are predicated upon those pluralist premises. And coupled (surprisingly) with both Pragmatism and even Idealism, Western Mankind developed a culture which could indeed solve many individual problems, and, even, crucially, make concrete things based upon their methods, but never as part of a single coherent and consistent basis!

Now, the above inadequate introduction does not, at all, do sufficient justice to the alternative, very different position that I am about to stand upon. But, as an entirely adequate exposition, by this writer, is available elsewhere,I will not labour all the arguments again here.

I will, instead, launch directly into a trenchant criticism of the bases of Western Thought, and its "supposed" zenith in Computing.

Let me trace my own trajectory in becoming a computing specialist.

I was initially a mathematician, which inexorably led me into Physics, and it was interminable problems in the study of "The Tessellation and Symmetry Properties of Re-entrant Polytopes" that drew me into Computing, as a major time-saver, concerning the calculations necessary for this work – for I had estimated that they would have taken me years, and I had a full-time teaching job to deliver too.

A colleague assured me that a computer program would solve my problems very easily –"The years of work could be completed in minutes", was his assurance. The first program that I wrote, with much assistance from books, certainly solved the workload problem, but also exposed the inadequacies of the methods employed to reveal anything more.

It was, in a sense, only related to Real Thinking, in its most mundane aspects. It was a calculator, and merely because of its speed, it tended to use wearisome iterative techniques, which enabled infinite processes, in which a loop was repeatedly traversed many, many times, and finally terminated when two successive results differed by less than your chosen accuracy value.

Now, though computers could simply evaluate normal formal equations – encapsulating some "Natural Law", such things were not its stock-in-trade. The major use was in evaluating solutions to problems that could be solved by converting the formal equations into sets of iterative forms – one for each variable involved.

And, starting with a guessed first estimate, the applications of these iterative forms took things to an ever better series of solutions, so, by repeated use, would home in upon the required solution.

Yet, two things must be said about such means:

FIRSTLY: The formal equations, which were the initial basis, could not possibly be the required Natural Law, because they were always extracted from extensive and carefully tailored contexts, both designed, and then maintained, to most clearly expose what was "being sought". Such things were true only of that context, and certainly not generally. And,

SECONDLY: it was because the involved Principle of Plurality is actually untrue!

What was being dealt with could only be both a simplified and modified case in an appropriately "tailored" environment. But, in addition this inappropriate form was then geometrically (or otherwise) converted into a set of iterative forms, thus involving a second transformation, but this time with a very different set of criteria, for these changes were designed to produce approximations that were converging (for an inappropriate, but similarly achieved transformation could just as easily produce a diverging iterative form, which would never home in upon the required solution).

Clearly, what is achieved by such processes is what is termed "a frig". It is a pragmatic trick, and it doesn't even home in on what it purports to. But, as always with all such tricks, Pragmatism intervenes - the "useable" result obtained is incorrectly given the weight of an eternal Truth! But, it must be stressed that the result is only for the "formed context": it is neither a general nor a fixed result.

Now, Mankind has become very skilful at the changes necessary to successfully carry-through all the necessary processes involved in these methods. And, coupled with the means to control contexts rigidly to what is required, as long as certain rules are followed.

These rules are NOT Natural Laws, but necessary controls defined by the iterative technique to ensure that it delivers.

But, that is NOT the same as having a full understanding of what was actually being processed. It was, of course, much more pragmatic than that. And, also, such means do have important limits!

To go further than a series of technical processes, the area involved must always be *understood*, otherwise the user gets lost in a collection of purely formal tricks.

Remember, the main purpose of investigations is precisely to increase our Understanding.

NOTE: No completely pragmatic ancient Bow maker who happened upon the perfect bow, would never be able to repeat it – it will only occur once! He will be lucky if he ever achieves anything comparable again.

Real Progress can only be assured by Understanding, NOT by remembering recipes!

To actually understand the phenomena of Reality is surely the primary purpose of Science.

Everything else is, at best, Technology, and, at worse, Mumbo-jumbo!

By a really increasing Understanding of Key Phenomena, many more possibilities opened up. The purely pragmatic – "if it works, it is right!" stance is always a very limited approach.

Indeed, I think it necessary to review what has been suggested here, for it invariably takes things significantly away from Reality-as-it-naturally-is, and takes us instead upon a deliberately simplifying, analytic journey, which can never take us where we need to be to advance our understanding, but, instead, by means of the results of certain things that can be achieved, and certain conclusions, that can be reached, takes us somewhere else. Words have been used that have been changed and are crucial and must be justified, if the whole exercise is to have any legitimacy at all!

Let us, therefore, take each in turn.

First, there is **Simplification**

Now Reality-as-it-actually-is is rarely simple enough for it to be immediately evident what is going on. And, removing things, from a studied context, will always simplify it to some extent, as will holding other things constant. BUT, who is to say that they are not involved in the phenomenon supposedly being addressed?

And, for every sought relation in the given context, different simplifications and removals will be necessary, to expose each and every currently targeted Law.

So, if a given phenomenon is analysed as being composed of a set of three Laws, each of which would require its own different modification to display the one we currently seek. THEN, we have not only a set of problems, but indeed a whole cascade of them, as we attempt to reconstitute to the actual original phenomenon in Reality-as-is.

Indeed, if these contributions in any way affect one another (as Holism insists that they do) then, our simple adding together of our extracted Laws will certainly not suffice.

We will have killed the "Lifeform" we are trying to understand, and then taking its now dead, dismantled parts and then, by merely putting them in the same place, are expecting to be able to explain what the living (integrated) whole actually does when left alone in Reality-as-is.

Now, you can see what they did, and why they did it.

In a mix of factors, where many have zero or little effect upon the phenomenon that interests us, these methods will work. So, they extrapolate the applicability to ALL possible cases, and make the same assumptions.

Of course, if NO simultaneously present factors EVER affect one another in any way, then the above described method will be fine.

So, those involved hurriedly-defined (or even just assumed) the Principle of Plurality, which affirms that such was indeed the case, and hence the method was always generally applicable. It isn't true, and hence it isn't applicable.

So, with the usually adopted stance, absolutely no material mutual modifications are considered to be involved. The assumed basis, as already revealed, for the Principle of Plurality, which, more or less, defined phenomena as being due to eternal Formal Laws and, in complex situations could always be merely summed quite validly.

Hence, simplification by both the removal or fixing of several factors could only make clear revelation of the sought for causes much more evident. Thus by repeated, but differently "farmed" conditions, the whole set of causal factors could be extracted one-at-a-time!

Clearly then, Analysis was possible by such means in experiments, and, of course, theoretically too.

Now, there can be little doubt – Plurality is NOT true, and the most telling proof is in Development and Evolution, and in the Emergence of the wholly new!

Summing Laws can never explain such things, which certainly exist, and must have had a trajectory of development –starting with non living relations and interactions, all the way to Man and to Consciousness.

So, Simplification is NOT a means of accurately revealing contributory factors "as they are and always will be".

We can use such means, BUT never as a means of theoretical explanation. It can, and indeed does, define sequences of processes that can be made to go in useful directions, but only via a series of tailor-made and separately organised contexts, and in an alternative, sequential way of bringing them together to produce an aimed-for result. Though Reality, of course, itself, naturally can do them simultaneously and necessarily very differently!

So, let us once again recap: Simplification has certainly "moved the goalposts" somewhat!

Next, we have to address **Idealisation**

How does this come into the usual methods used?
It was via Mathematics!

We must remember that Mathematics had been the first coherent set of methods that Mankind had not only invented, but developed into being a valuable discipline. But, once again, Reality did not directly deliver up neat and useable Forms.

Things were evidently only *generally* circular or square-*ish*, and any natural lines could only be somewhat straight-ish. So, in place of these real forms, Mankind "extracted" perfect circles and squares and completely straight lines – perfect or Ideal shapes as tidier substitutes for their actual approximations in Reality.

And, in Mathematics it was, thereafter, ever thus!
It can be no surprise, that this researcher insists upon placing all these modifications, NOT in Reality, but in a purified reflection of it, which he calls Ideality.

In that World, only ideal Forms were allowed, and it was these alone that Man investigated to a remarkable degree. And, here, it could not be said, as they had in other areas, that the actual things were indeed perfect Forms, only distorted by multiple effects. They really were as they were seen – never matching the Ideal forms. To use them instead of the actual forms, was most definitely Idealisation.

Reality had been polished to bring things into perfect and formulateable shapes, so that they could be investigated and used.

The language of Mathematics was made up ONLY of these perfect Forms that Man himself had devised, based upon cruder and varied analogues in Reality. And, the major developments in this new discipline came to be the possible relations between these Idealised Forms.

But, it wasn't a complete waste of time.

The Ideal Forms did often approximate to those actually observed in Nature, and the physical means of then extracting all sorts of useful and required results was much easier with the idealised versions

And, Mankind developed this approach to a remarkable degree, and it was very useful. Indeed, the tendency for complex mixes of many factors to settle into a balanced stability assisted greatly with evident efficacy. But, of course, when such Stabilities collapsed, absolutely, no indication was available in the methods used to predict it or even describe it.

The perfect Forms of Mathematics, and the similarity to Stability, were not identical, but conveniently similar ONLY!

So, the usual Method was strictly not only idealised, but also limited to Stability too!

But, when used with actual data from Reality a tailoring process to fit up that data to the idealised and general forms of Mathematics was necessary, to bring it as close as possible to a given particular instance.

And, Mankind got very good at this fitting-up – so much so that they slipped into believing that the ideal form itself was the actual driving essences of Reality,
"Reality was considered to be wholly determined entirely by purely Abstract Idealised Forms!"

Wrong again!

Of course, such a philosophically idealist stance was certainly mistaken, and pushed scientists towards the worship of Form above all else. Clearly, Idealism, which was natural to mathematicians was very often carried over into interpretations of or "explanations" of real World phenomena.

But concrete Reality was about real material things, and this influx of idealist ideas, pushed the science ever further away from its actual subject, into a parallel world of Pure Forms alone, which we term Ideality.

NOTE: A modern Sub Atomic Physicist will spend literally all his time at a blackboards manipulating equations, and doesn't bat an eyelid, for he considers what he is doing is dealing with the "essential driving forms" of his studied World!

Now, though these criticisms are indeed valid, there was no obvious alternative to apply. The Buddha's Holism may well have been more true than Plurality, but how could an investigative methodology by built up upon that? Well surprisingly, it could, but only in a very different range of situations.

The Buddha was a spiritual leader and was widely revered for his wisdom and understanding-about-people. His ideas about Mankind, spread across Asia and underlain many religious approaches to Human Behaviour.

But, it certainly wasn't applicable to problems of production, as Plurality very quickly turned out to be. And, though breakthroughs in Science, due to a definitely holist approach, have certainly occurred, they are generally NOT to do with manufacture and production.

Charles Darwin's Natural Selection is undeniably holist, as was Stanley Miller's attempt to begin to understand the naturally occurring ascent from Non-Living processes, all the way to the Origin of Life, via his remarkably conceived of experiments, which from a starting point of primeval gases and water processed cyclically only with the addition of heat, produced amino acids – crucial building blocks of the genetic material of all living things.

And, this result was achieved in an experiment that ran continuously for only a single week! Nevertheless, as yet, NO generally applicable holistic experimental methods had been produced. And, even Miller could not (at the time) take his brilliant experiment any further. It seemed to be a one-off!

And, as it turned out, to get anywhere at all, certain major philosophical gains had to be made, but they took around a further 2,300 years from the outset of Mankind's serious investigating of Reality, in Ancient Greece, for, any real progress to be made beyond Zeno's

Famous Paradoxes. And, this was only achieved finally by the German Idealist philosopher, GWF Hegel around 1800.

The problems he encountered were connected with the rigidity of Formal Laws, which simply could not cope with Qualitative Change, for though quantitative change was adequately approximated to, radical transformations were totally unaddressed.

For, the crucially important emergences of the entirely new, which quite clearly did happen, they were never addressed.

Indeed, the vital processes of Human Thought, by which breakthroughs are made, were not understood at all.

Now, Hegel's chosen topic was "Thinking about Thought", and such things were essential in his studies, but entirely absent from all Formal Reasoning, which were necessarily limited to mere alternate mixes of already known components.

Hegel knew very well that such reasoning could never extend understanding – indeed that the emergence of Qualitative Change in all Development had to be crucial.

The Key area for Hegel was the regular, and so far inexplicable, emergence of contradictory pairs of concepts, each one would work, on some occasions, but not on others, and both seemed to arise quite naturally via the universally trusted Formal Logic.

The most significant form was termed a Dichotomous Pair of contradictory concepts - the most famous example of which had been Zeno's Continuity and Descreteness as clearly demonstrated in his remarkable Paradoxes.

Hegel concluded that a solution could only be found by addressing the contradictions of Dichotomous Pairs, and transcending the impasse which they quite clearly caused.

Now, so-called "solutions" had been developed for millennia, by keeping both, and switching between the alternatives purely pragmatically. But. Though this was to an extent, "practically useful", it was useless theoretically. A Dichotomous Pair always led to the unavoidable termination of the line of reasoning which led to it.

Something very wrong was involved, and had to be solved.

Hegel's attempt to understand Human Thinking had, at every attempt , using only Formal Logic, come to an unavoidable impasse, whenever a Dichotomous Pair was encountered.

Using only Formal Logic was clearly insufficient.

It was clearly useless whenever qualitative changes were involved.

Hence, his declared objective was to devise and develop a consistent Logic of Change, which would vastly extend our explanations and understanding of Reality.
Hegel considered that current Thinking (when explained formally, was hemmed in on all sides by impassable barriers at each and every Dichotomous Pair,

Indeed, it was even worse that that.

When halted by such a Pair, thinkers would even "step-over" them to "safe and developable expanses beyond. So, the impasses became the boundaries of certain strictly-local "Subjects" or even "Disciplines", and this was so particularly among scientists.

For, their studies were repeatedly fracturing into seemingly "self contained" and unbridgeable to" limited areas of study, and investigators chose which of these suited their current investigations as their particular discipline.

The Sciences - Physics, Chemistry, Biology, Geology, Astronomy etc. etc all were all delineated by such impasses. And, further impasses, within these defined Subjects, quickly sub-divided them into so-called "Specialisms".

Clearly, Hegel knew that these were not naturally separate areas, and that Thinking was crucial in all of them. It was the task of Philosophy to reveal the cause of the problem and solve it!

Otherwise, the fundamental and generally applicable means, available to Mankind, would be compromised into separate areas with totally inexplicable and unbridgeable connections.

The problems were a failure in Mankind's current Thinking about Thought!

Now, Hegel had certainly chosen the best place to study in his search for the crucial Processes of Qualitative Change: it had to be, of course, in Thought itself.

He didn't merely juggle with prior conceptions, but sought the conditions in which breakthroughs were not only possible, but also clearly essential too.

He was acutely aware that in Thinking, the appearance of the wholly new could not merely be an original mix of known elements. Indeed, as a philosopher, he had many times experienced the realisation of new concepts, and he finally narrowed it down to the transcending of contradictions.

So, he decided to concentrate solely upon the emergence of Dichotomous Pairs of concepts. The fact that both arms of the dichotomy couldn't both be true, meant that we were judging them from the wrong standpoint. So, the search began for the premises that were assumed, often as "obvious" in such cases.

Hegel knew he had to first identify the assumed premises, and then find the flaws that must be embedded within them.

His first discovery was surprising, for it appeared that the very same premises had been assumed for both arms of all Dichotomous Pairs!

Clearly, the problem lay with these assumptions, which usually didn't seem like arrived at decisions, but rather the "obvious stances" that were actually at fault.

If he could correct the assumptions made, the Dichotomous Pair would both be explicable, and hence a new more general route would have been found. The impasse would no longer terminate that line of reasoning, but enable TWO consequent lines of reasoning, where NONE had seemed possible. The transcending of dichotomies could reveal the means to whole extended areas of possibilities: the barriers between seemingly self-contained areas would have been breached.

Hegel's position had now hardened into a rejection of the universally adhered to method of Formal Logic.

It was useful, but significantly unable to address crucial questions. He would from here on in apply all his thinking to addressing contradictions in the new way that he had devised.

He was intent upon constructing a Logic of Change, and it would have to be a very different methodology to Formal Logic, for that always assumes eternal abstract Laws, and mere complication of many such Laws as sufficient in all circumstances.

Hegel knew that such a simplified methodology did not accurately reflect what actually happens. But, crucially, he also knew where to find the kind of Change which he sought – in Thinking itself! The task he undertook could only have been attempted by a philosophical idealist.

For, the scientists of that time were strict, mechanistic materialists, and also completely wedded to Formal Logic. They considered that everything in Reality was determined by eternal Laws! They were besotted with rigidly controlled Domains of Study, and a wholly pluralist approach.

Such a straightjacket would never transcend the self-imposed limitations that they subscribed to. But, an idealist like Hegel, had correctly realised that the flexibility of Human Thought held the Key, to breaking out of the rigidity of Formal and eternal ideas.

Hegel knew for certain that the current consensus approach would never be able to handle Qualitative Changes, and their crucial role in ALL developments.

And, his recursive studies into Thought itself, in spite of being carried out by an idealist, would indeed allow progress to be made!

His identified touchstones were the Dichotomous Pairs - like Zeno's Continuity and Descreteness, and his task was to explain how and why they actually emerged.

But, once he revealed those things, his next task was to transcend the impasse that they invariably precipitated.

Why did each arm, of the Pair, work in certain circumstances, but not in others? What truth, if any, was resident in each arm, but limited as to where it worked correctly?

And, then, of course, there was the crucial question "Could both arms be fully explained by a single transcending explanatory basis?" He realised that if he tried to unearth the premises for each and see where they came from, he had every chance of changing those premises in such a way that the impasses would be transcended, and the line of reasoning would no longer be terminated permanently at that point.

And, his discovery and consequent methodology was revolutionary. He revealed that the very same premises led to both arms of the dichotomy.

So, a vigorous and deep criticising and changing of those premises that were the actual cause of the problem.

Many such dead-ends in reasoning could be transcended by a much better explanation, which could be appropriately addressed could if one be produced. Yet, to merely say that the Dichotomous Pairs were simply wrong, would NOT do!

For, clearly, some truth resided in each arm, so that in appropriate conditions it would be successfully useable. And, Hegel arrived at the necessity of a critique of such premises, and the substituting of an alternative set, which articulated a rational way out of the seeming impasse in all circumstances, and clarifying explanations were added to each arm, which permanently dissolved the seeming impasse.

The old premises were simply NOT good enough! They approached the contained truth merely by a suck-it-and-see method only. They failed to explain what was happening and why very different outcomes would occur.

So, Hegel's method, instead of halting at an impasse, or alternatively switching to the opposite to see if it worked, could with changed premises sail straight through every time.

His Dialectical Method, therefore, sought out Dichotomous Pairs, as the most reliable way of indicating that the premises involved were inappropriate, and hence focussing modifications just where the problem lay.
It worked!

By purposely seeking out the total failures of Formal Logic, Hegel began to throw light upon important assumptions, almost always due to Fixed premises, when what was needed were rules that gave alternatives in

differing circumstances - Laws were no longer limited to fixed rules!

So, Hegel began to highlight the crucial Events or Interludes where Real Transforming Change would occur. Whereas Science chose to study Stabilities, he concentrated upon when dramatic Changes were rampant.

But, though you might think that these would stick out like a sore thumb, that wasn't the case at all!

In fact, in most circumstances, they seemed to never appear, and when they did, the duration was so small that they were soon almost undetectable, "like a winkle on a whale"!

Indeed, Stability was so dominating, that it was usually taken as being the norm, and by only studying Stability, Mankind was covering what was going on literally all the time. It was only under certain extreme circumstances that the usual dependable premises failed.

Yet, Hegel had chosen correctly, these interludes of significant change occurred most often in Human Thinking.

The times of Qualitative Changes came to be called Emergences, and crucially, because of Marx's transference of all Hegel's gains to Materialism, these discussions ceased to be solely about Thinking. Indeed, the actual Development of Reality was an even more basic case of the same sort of phenomena - even including impasses and breakthroughs.

For example, the impasse, socially, would be a slowing down and even halting of development, while a consequent Crisis, Collapse and roiling period of multiple, creative Changes, would be termed A Social Revolution!

Clearly, once Marx had carried out this vital transference, we were no longer only talking about modes of Human Thinking. It would be shown there more clearly than anywhere else. But, it was also about Development in general.

Just like a completely new and original idea, Emergences took place in physical Systems – leading, as we know they did, to Life, Man and even Consciousness,

Indeed, going backwards from what exists upon Earth NOW, must have had antecedents, within a developing Universe, where ideas were absent, but systems at all levels could experience similar Changes and Crises, and, of course, Revolutions!

Of course, it was such possibilities which impelled Marx and Engels to begin the extrapolation into Human Society, and its developments and Revolutions. But, what is involved MUST occur everywhere, and in all natural things.

Their objective, which they termed Dialectical Materialism, still hasn't been carried over to everything else. For example, it still has to be developed in the Sciences, and most particularly in Sub Atomic Physics.

For, when this didn't happen, the Catastrophe of the Copenhagen Interpretation of Quantum Theory took over, and is leading that area of Science deep into the mire!

Clearly, things were changing, which were no longer merely incremental - not at all the usual Quantitative changes, which, most certainly, could be incremented, but only within a Qualitatively Stable System. And, real Qualitative changes only happened when a seemingly eternal Stability, began, first to wobble, moving then to Crisis, which then swooped onto collapse – at which point a major episode of truly dramatic revolutionary changes was unavoidably triggered off! Indeed, an Emergent Interlude had occurred which invariably resulted in totally unpredictable outcomes.

Now, to make anything general out of all of this you have to get to a handle-able Tempo.

Consider **Geology**!

The tempo of geological changes are not only desperately slow, but so slow that even Emergences often do not show up clearly within the record-in-the-rocks. Even the most significant Events can be hard, if not impossible to investigate in that record. Most just appear as "step-changes", and give no indication as to exactly what occurred and why.

Clearly, "something" pretty important took place, but what it was is rarely evident.

Nevertheless, these clear "step-changes" have always been used by geologists to divide up the history of the Earth, so that layers of deposits and even Fossils can be positioned at certain times in that overall History. So the various cataclysms in that History to at least give us a sequence of Geological Eras!

While in Biology, the actual Evolution of Living Things was so slow in Nature that the initial conclusion by Mankind was that all current plants and animals had been exactly the same in the past as they are now "since their original creation"

Hegel had been correct, to pick out Human Thinking as the most investigatable area - For its Tempo is exceedingly fast, while, in the exact opposite extreme the Heavens seemed to be totally fixed, and had been the same "for ever"!

Only when Tempo is considered can the oscillation between periods of Stability, and Interludes of Revolutionary Change be addressed. It took this researcher 50 years before he managed to formulate *The Theory of Emergences* in 2010. And, it only occurred then because of his unusually wide range of inter-disciplinary researches involved in helping a wide variety of studies in many very different disciplines, with their diverse computer requirements, to grasp the overall patterns involved in the many problems and oscillations that evidently occurred everywhere.

Indeed, as a qualified physicist, I have to observe that my discipline has, even today, failed to learn these lessons, and continued to believe that all of Reality stems wholly from fixed Physical Laws, so will in time be totally explained by a predictable hierarchy of caused Levels, all the way from Elementary Particles to Human Consciousness.

May I, as a physicist, myself, assert, "Not a chance in Hell!"

The Key thing about an Emergence is that wholly new creations, and their inter-relations, never before in existence, can be, and indeed are, produced which can never be predicted from the prior, producing levels.

Indeed, what happens within an Emergence involves a sequence commencing with wholesale Collapse and seeming Total Dissolution, only to then miraculously reverse into the building of a wholly new and Higher Level, which, even then, only happened via a series of better, but failed attempts that finally result in the establishment of a New and persisting Stability! This is, of course, why all attempts at explaining the Origin of Life on Earth have failed. No one has the faintest idea of what occurred in that Emergent Episode, that must have commenced with mere chemical interactions and finally emerged with the first ever Living entities.

So, what is actually studied rigorously and extensively in Science? It is restricted to processes within Stability only! The nearest environments to the assumptions inherent in the Principle of Plurality only are available reasonably well within Stability Indeed, the nature of Formal Equations is largely, if not exclusively, quantitative. The Laws predict related changes in certain quantitative variables, BUT only as an eternal , fixed Law –implicitly they seem to offer predictions over all possible ranges, but that, of course, is never true. In fact, every single such relation always fails totally, once its applicability range is exceeded. And, it is interesting how such failures are "merely signalled" by the relations.

They deliver what are termed Singularities, which are nothing but signals saying only, "There is absolutely Nothing possible from this law from here on". These are NEVER actual predictions at all, but mere signals of failure!

To turn a Singularity into a supposedly Physical entity or Event is a totally insupportable, purtely-speculative construct. To say what occurs in such circumstances would only be possible via a profound understanding of Emergencies – proved conclusively by the impossibility of using the relation to predict beyond such limits.

The attempts to extend things beyond that limit by using iterative forms – slowly derived from the original formal relation, actually constitutes a frig – a trick of getting something from a dying relation, but, even then, not much.

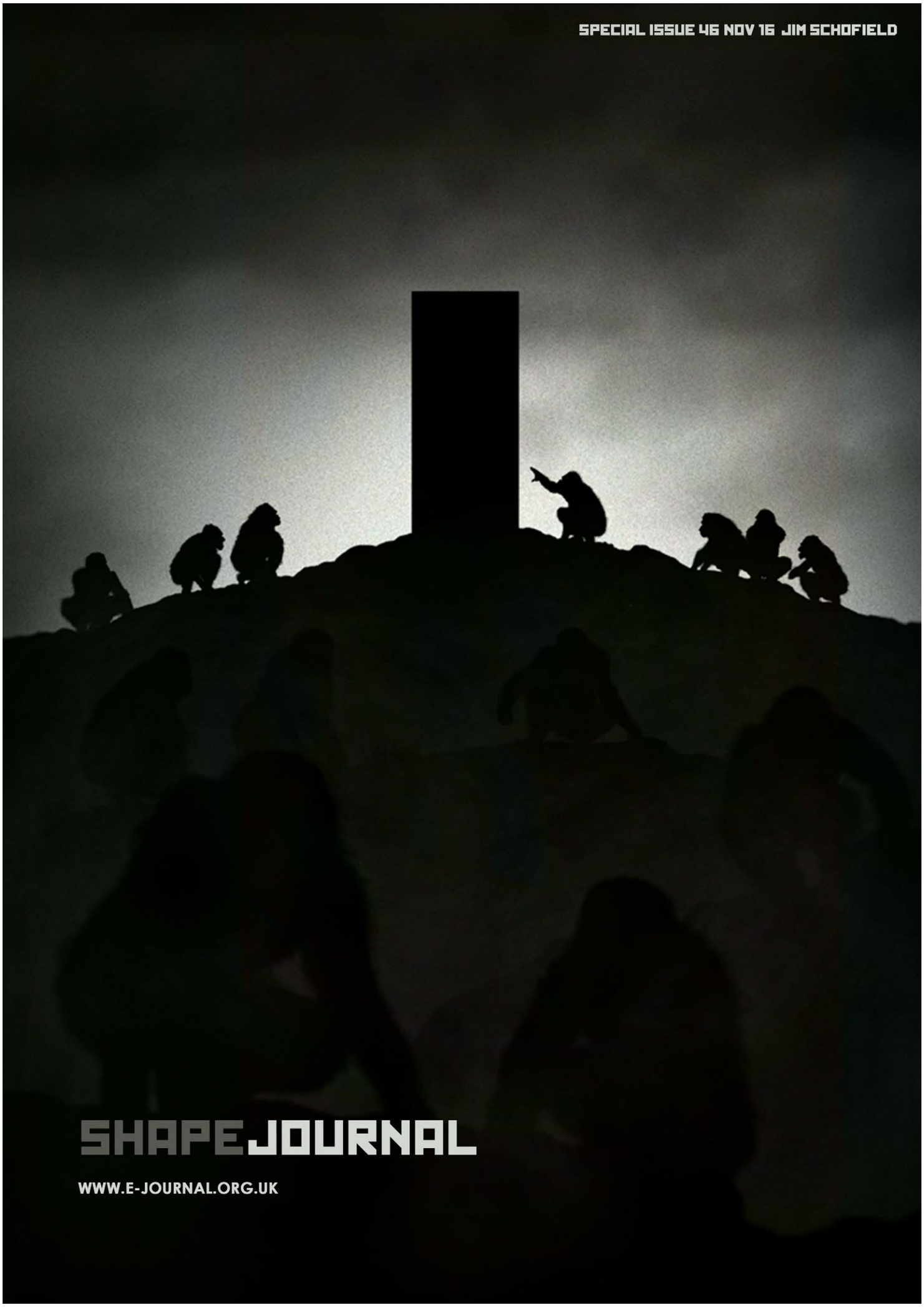
An Epilogue:

Since the completion of this paper, significant gains have been made theoretically, in important areas of Physics, and involving the beginnings of A Holist Approach to Science. With the next few months key contributions will be published by this theorist on SHAPE Journal.

Jim Schofield

October 2016

SPECIAL ISSUE 46 NOV 16 JIM SCHOFIELD



SHAPEJOURNAL

WWW.E-JOURNAL.ORG.UK