

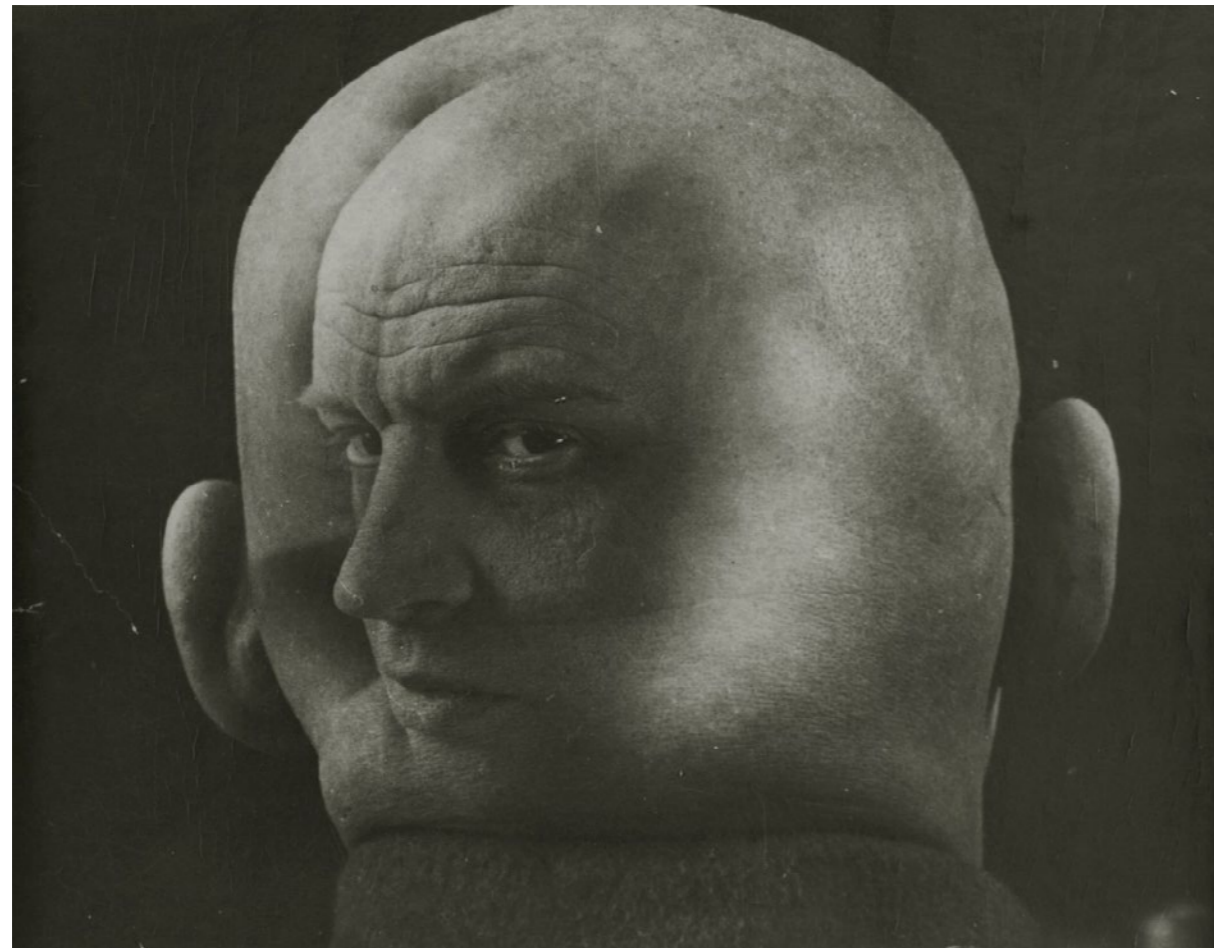
# SHAPE JOURNAL

THINKING ABOUT THOUGHT

REALITY MAN AND PROBABILITY / DEVELOPMENT IN ISOLATION / DEFINITELY NOT MAYBE  
THINKING NEW THOUGHTS / WHAT IS LAW / THEORY OR FORM?

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## Thinking About Thought

Special Issue 39 / November 2015

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## Preface: thinking about thought?



This Special Issue of SHAPE Journal entitled *Thinking about Thought* is part of a long study, primarily into Sub Atomic Physics, but also, necessarily, taking a detailed, philosophical look at the trajectory of ideas over significant stages in its recent history, which have, finally and irrevocably, moved it over, bodily, from a steadfast materialist standpoint to an almost completely idealist one.

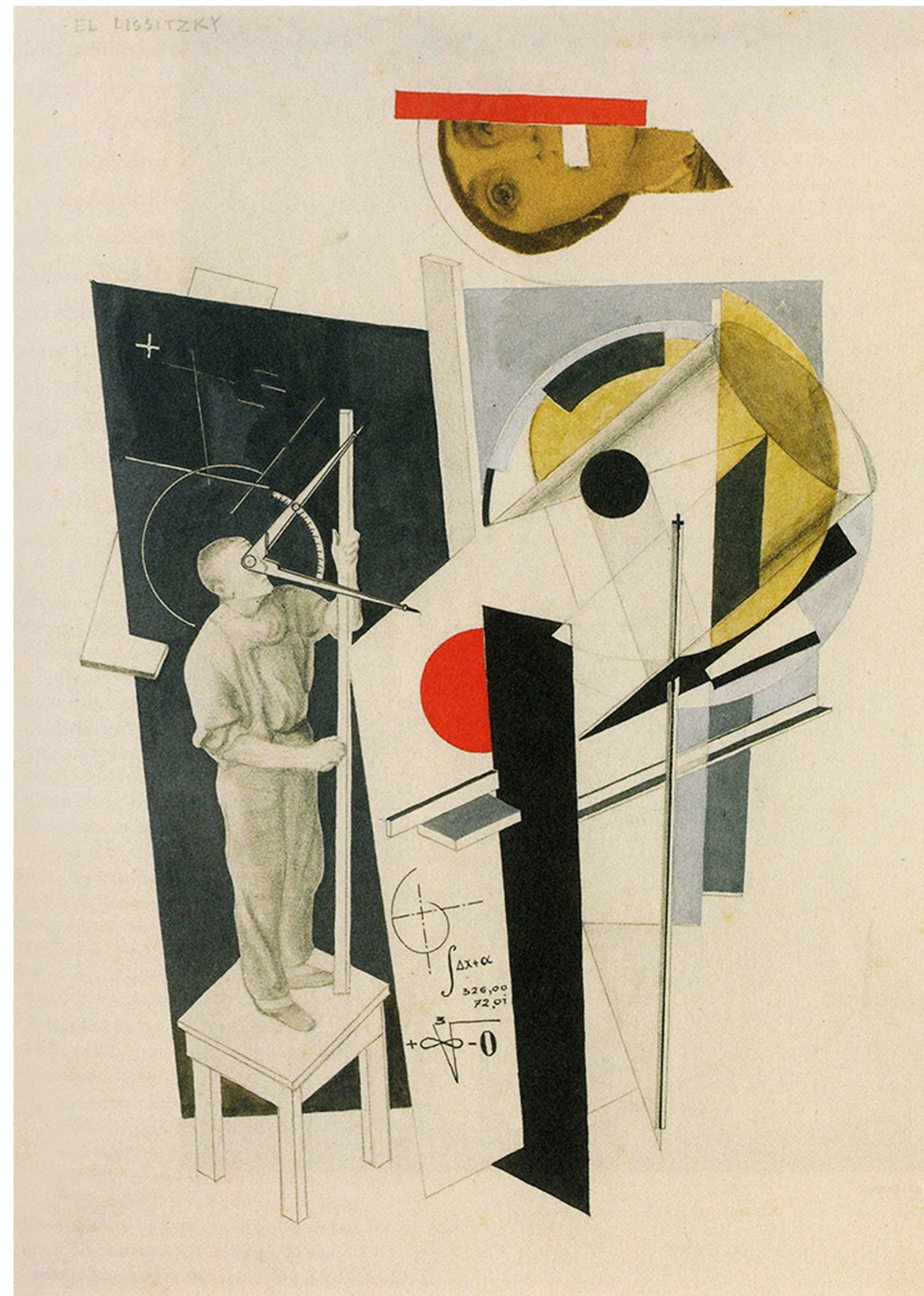
This initial preoccupation has led to further research into specific extra areas, which are not the usual ground for Philosophy, but here, in this truly, momentous Crisis in Physics, they have become absolutely paramount.

The Ground of Science is addressed particularly in its underlying key – The Principle of Plurality, but also in its congenital feature of Pragmatism, and its beliefs, taken from Mathematics, as well as its many purely pragmatic tricks, always justified by “If it works, it is right!”

The trigger for this set of papers was a criticism by David Deutsch in his paper, “Definitely not Maybe” in the *New Scientist* magazine (3041), about the role of Probability in the Copenhagen Interpretation of Quantum Theory. And, this inevitably pulled in more general assumptions too.

Clearly, this Special needs to be taken along with the whole extended body of work, by this philosopher, – all of which are available in the SHAPE Journal, Blog and Youtube Channel.

**Jim Schofield**  
Nov 2015





## Introduction

Now, whatever topic we decide to think about, we can't just switch-on and do it without any constraints at all. We can only use what we already have experience and knowledge of, and use that as our starting point.

And such is, of course, never ideal – for, as they say, “If I was trying to get there, I wouldn't have started from here!” For, even our current methods of thinking are there because they were selected-for during Man's prior mode of life and developments, which, remember, occupied almost 95% of his history, when he lived as a constantly wandering hunter/gatherer. For, in that extended period, Man had no great strength, no large, weapon-like teeth, or even superior fleetness of foot. Yet, he did, nevertheless, not only survive in an intensely hostile World, but also actually prospered. This success was, of course, because of his intelligence, but even that was inevitably focussed into a narrow range of pressing activities, involving both the getting food and escaping carnivore predators.

So, in spite of this intelligence, and his remarkable achievements of language and the control of fire, Man was never equipped, by Natural Selection, to think abstractly, and solve problems associated with the question, “Why?”, but, instead, only to answer the question, “How?”

So, in more sophisticated types of thinking, he had to find ways of “pulling himself up by his own bootlaces”, and this never allowed him to directly achieve the necessary methods to arrive at real hidden truths.

Man could only find ways of getting closer to reality by using what he had acquired for other purposes, but in slightly new ways. But, these were still essentially pragmatic and did not deliver explanatory causes but, instead, “descriptive narratives”.

And these began the long process of adding limited extensions to his well established pragmatic conceptions, yet always hard, if not impossible, to validate by observation or even experiment.

They differed from strict pragmatism in various ways, reaching for, but never delivering causal explanations, and hence were consistently pragmatic frigs, rather than real explanations.

And then, they ALL would always and inevitably end up in what seemed to be insurmountable impasses. The problem became, “How could these impasses be transcended to allow real explanatory progress to flower.”

Now, significant developments have been made in understanding that trajectory by a series of thinkers, led by the brilliant German idealist philosopher Friedrich Hegel, yet NO successful transcendence of a past inadequate method ever solved the problem once-and-for-all!

Indeed, even after such rare, revelatory episodes, the thinking of those involved, still involved a clutter of past assumptions, conceptions and even principles, for forever continued to mislead him in his further deliberations.

So this small group of papers attempts to deal with the crucial area, which currently is causing many severe difficulties. It will mainly be about probabilities, but as a contribution to scuppering the main culprit – The Copenhagen Interpretation of Quantum Theory.

# Reality, Man & Probability

## the diverse & somehow faltering ways of seeing

When and why does Probability work?

Well, I know very well when it would never be necessary – it wouldn't be required at all if a single natural law were acting entirely alone! For then, each collected data set would be entirely in accordance with that single law: every data point would fit its equation perfectly.

So, in all other cases, we must be talking about the normal and ever-present situations, in which many, and very different factors (laws) are acting simultaneously, BUT, crucially, NOT always in exactly the same proportions to one another. For that, too, would deliver a set of measurements delivered by a single, but this time overall or compound, law (or set of laws).

Indeed, this assumption is proved by the very skilful and necessary farming of experimental situations that are achieved by expert experimenters, who can invariably reduce all but a single targeted factor to minimal proportions. Yet, nevertheless, they still show varying oscillation in the measured results.

If ever we found such a seemingly single law, it would inevitably mean it was a composite law, made up of contributing sub-laws in absolutely fixed proportions - we would not be able to discern it any other way! For, when we carry out experiments, we literally never achieve just a single law acting alone, or even fixed amounts of each and every law that is simultaneously acting. We, absolutely never get such solid results: we always get what seem to be randomly varying results around some dominant factor, which we are seeking to display and extract.

So, to emulate the ideal fixed set of contributions delivering just such a single law, we take averages over many separate runs of the experiment. We haven't eliminated the varying, aberrant effects, but have negated them, leaving our targeted law relatively clear.

We are effectively using Time to ensure the delivery of the required ideal and unmodified law.

NOTE: but, notice that there is NO guarantee that what we then have, in our hands, is our assumed-to-exist and targeted fixed law. The averaging could, indeed, also cancel out any intrinsic variations in that law. Indeed, what we achieve will be an *ideal* version of that law.

Clearly, we can actually never escape from the usual situation, in which a multiplicity of laws (or more probably *factors*) are acting together, but never in exactly the same proportional ways, moment-by-moment. So, any measured result will unavoidably reflect the actual composition at the precise time of measurement, and allows delivery of a result at each and every measurement, with differing additions to every possible, organised-for and ideal law.

Clearly, in addition to our usual theoretical and pragmatic conclusions, there is another, which must also be drawn.

All natural situations throughout Reality are ones in which multiple factors are always acting, and most of the time we do not know what they all are. We attempt to minimise this unhelpful situation by skilful-farming of the experiment's context. We remove as many non-targeted factors as possible, and by suck-it-and-see methods, control as many of the others as we can, and, finally by averaging, eliminate the effects of all the others.

But, to ever achieve such a situation, we have to have started out with a clear target – the objective to reveal and extract a certain previously glimpsed, but obviously crucial factor that we are confident we could then use productively.

We target this favoured factor, and act upon all others, so that we can measure a range of situations, which will deliver the effects of our chosen factor, over that range, and allow from that gathered data set, some form of general rule – an assumed to be Natural Law.

Yet, to get it, we had to significantly alter a real world situation, to take it a long way from its usual state, and instead create a false, but amenable, man-made state focussing artificially upon a given factor, to the





Multiplicity?

attempted exclusion of all others. But, even then, with the law in our hands, we still cannot use it in Reality-as-is. It will only act predictively, if situated in exactly the same conditions as pertained when it was revealed and extracted that is from a particular rigorously-farmed Domain. We can never use the “Law” in Reality-as-is!

Now, at such a juncture, we naturally slip-over-seamlessly into then assuming that the law in the carefully-farmed Domain is exactly the same as the version of the law when it acts in totally unfettered Reality. This important assumption is the famed Principle of Plurality, and that is incorrect.

So, returning, once more, to our intended study area, for *probabilities* to be necessary, in such experiments, we must have a multi-factor situation, in which the contributions vary all-the-time, AND, the situation must be beyond our usual methods of control, so that we cannot farm it in the usual manner.

Thus, instead of each measured result conforming to a single “law”, the results would vary, about that law, and the only way to get the law that we are seeking, would be by taking averages, or, alternatively, somehow, getting some idea of the relative contributions of a multiplicity of factors - each with its own law.

Of course, this is a perfect example of the “chicken-and-the-egg” problem, for to get these other laws we have to use our current method separately for each with every one requiring its own ideal context, and then assume a simple addition of all of these, and in a context, which is guaranteed to match none of them. Or, if we are lucky enough to be able to farm the situation down to only TWO factors acting together, to take a combination of both to deliver the measured results.

Now, this arrived-at possibility is somewhat similar to what they do in the Copenhagen Interpretation of Quantum Theory, where the hidden factor is deemed be wave-like in nature, and hence, when acting, we could involve our separately acquired knowledge of waves and their performance embodied in Wave Equations, which can then be used, even if they have no idea what it is, and why it occurs, to model the phenomena found in that area. (See *Analogistic Models* by this theorist)

Needless to say, there is more to it than that, so we will return to this rig somewhat later on.

Now, the main description, given earlier, has become THE way to do experiments, as all situations fit the multi-factor case.

So, we can say that it is a General Rule – all situations include a multiplicity of contributing factors

Now, a particular case has become dominant in the Sub Atomic area of Physics, ever since the discoveries in the early years of the 20th century. This assumes the effect of a wave-like component, (but only sometimes), affecting a particles movement. With such an amalgam, knowledge of the formula for a wave can be used to associate probabilities (derived from the usual amplitudes of the wave across its effective extent) with the possible positions of the particle involved when in such a phase.

Now, quite clearly, as there is absolutely NO accompanying explanation as to why they should be able to do this, it has to be a pragmatic trick! Mathematicians are very good at such things: they have been doing them for millennia; so in this perplexing situation, they set about, in their well-trying ways, of constructing a useable rig. After all, mathematicians are not concerned with concrete causality – only with Form.

The physicists, though thrilled to bits with the possibilities, also had to have some kind of accompanying narrative, so they concocted one which was a half-hearted attempt at some physical causes, PLUS some necessary “validating” modifications to the philosophy, which had dominated Science since its inception.

It goes something like the following (don’t hold your breath!). The idea is that the particle, with the usually accepted properties of such an entity, is also affected by its own, accompanying wave, and when in such a phase, could be in a whole range of positions, and the probabilities of it being in each and every possible position, could be individually calculated for the whole wave (using what were usually the amplitudes of a real wave, but here turned into “probabilities of position” for the associated particle.

In addition, of course, it will usually involve many re-runs to get the necessary data to confirm that these probabilities do indeed deliver the goods. So, instead of a single particle having a simple trajectory “through” the “region of the wave” we get only the possibilities of transitions of all paths through as an overall pattern.

Clearly, not one single trajectory could be predicted, but, on completion of a sufficient number of such paths, the overall pattern would finally match with the predictions from the Wave Equation and its probabilities.

Now, believe it or not, the ideas involved in such thinking are not entirely new: the basis has been around for a considerable period. Indeed, literally all early scientific experiments were unavoidably affected by many different factors, happening, simultaneously, yet, in some cases, it could be ensured that these could be “compounded” into something extractable!

For, in calorimetric experiments, the credo, “Stir thoroughly, and wait for equilibrium to be established before measuring”, was just such a means of ensuring that overall results could be extracted – for the acting, multiple factors were effectively randomised (mixed) as much as possible, to minimise the moment-by-moment changes. But, such methods amounted to merely physical means of including all factors into an extractable, overall set of results. So, we were doing summed overall probabilities before we were even aware of it.

On careful consideration, however, we have to admit that Reality in all its locations will always be a mix of many different factors - all of them pulling the situation towards its own individual outcome. That is clearly totally unavoidable!

But the question remains, “How do these multiple factors interact? Do they merely add together (unchanged) to give an overall, resultant effect, and a consequent overall Law? Or, do they actually modify one another in diverse ways, so that the very same set in different proportions, could actually produce very different modified laws?”

NOTE: One important consideration in this is that there has to be a source or cause for the properties and inter-relationships involved. And, if these only produce eternal, never-changing laws, then the causes themselves must be totally integrated into their source.

On the other hand, the possibility of the variability of factors makes the source, not some single, eternal property, but the result of the full, actual context involved. Which is likely to be the case?

The Sum-Assumption is called Plurality. And is the current accepted standpoint in all the Sciences.

While the mutually-affecting assumption is called Holism, and is always ignored as being both too unanalysable and unpredictable to be effectively used! But, Plurality dominates because Mankind, in its characteristic pragmatic way, learned how to seemingly make-it-true, in specially organised localities – even though in Reality-as-is (that is totally unfettered); it is never the case!

For, Man finally learned how to isolate, filter and then control situations in such a way as to leave a single factor evidently dominant, being not only completely displayable, but also extractable, and even useable, as long as its “idealised” Domain was set up, and then maintained throughout both the necessary processes of revelation and use.

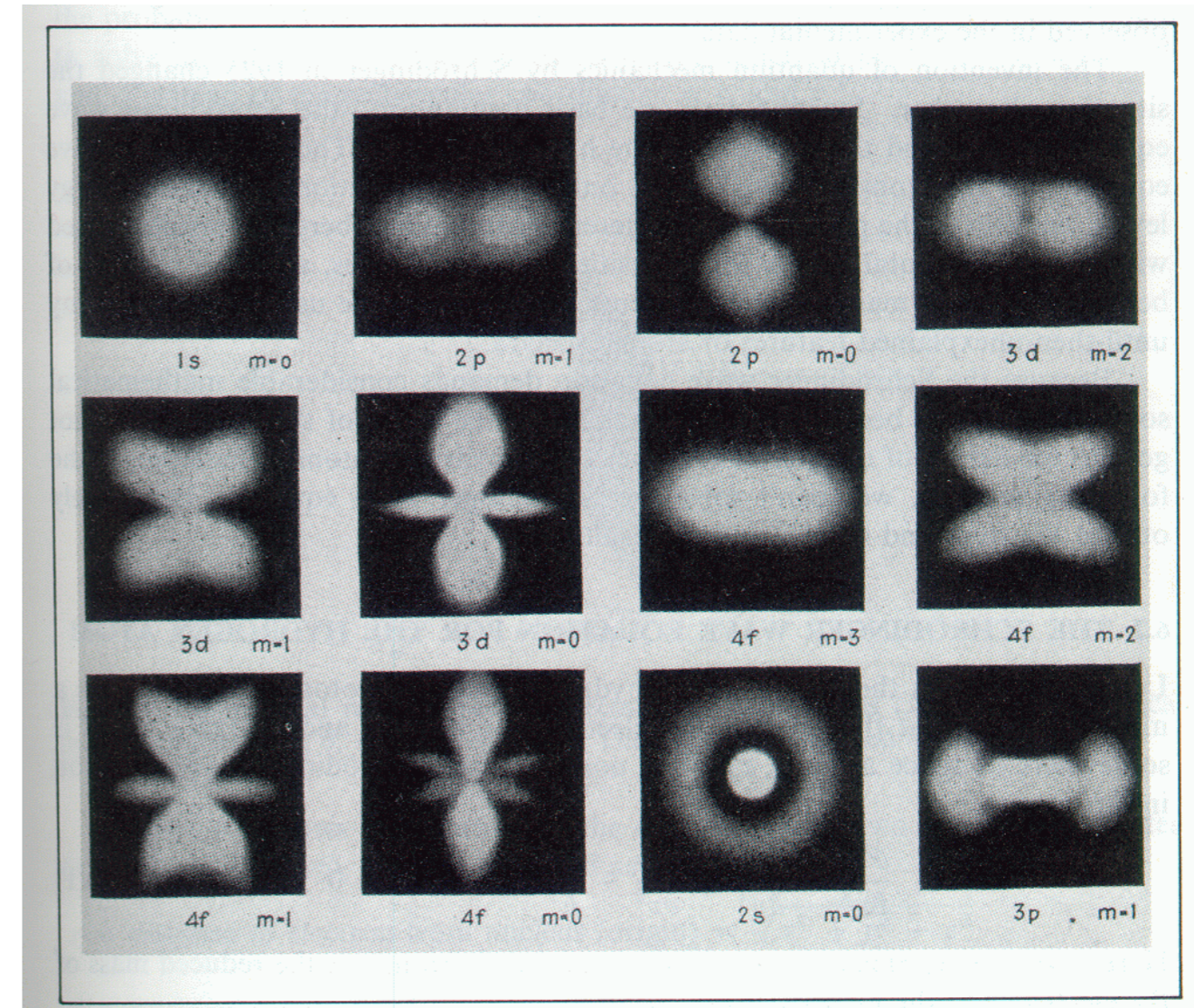
Now, apart from the assumption of Immutable Laws that is embodied in a subscription to Plurality, there is also another problem concerning individually varying contributions to an overall combined effect that is to be revealed completely.

It is the problem of, “What actually causes the fixed and unchanging Laws, which are then necessary to deliver clearly evident, ever-varying effects, and consequent differing results? It can only be that there must be a constantly varying supply of the resources necessary for each and every individually-acting, yet fixed, law.

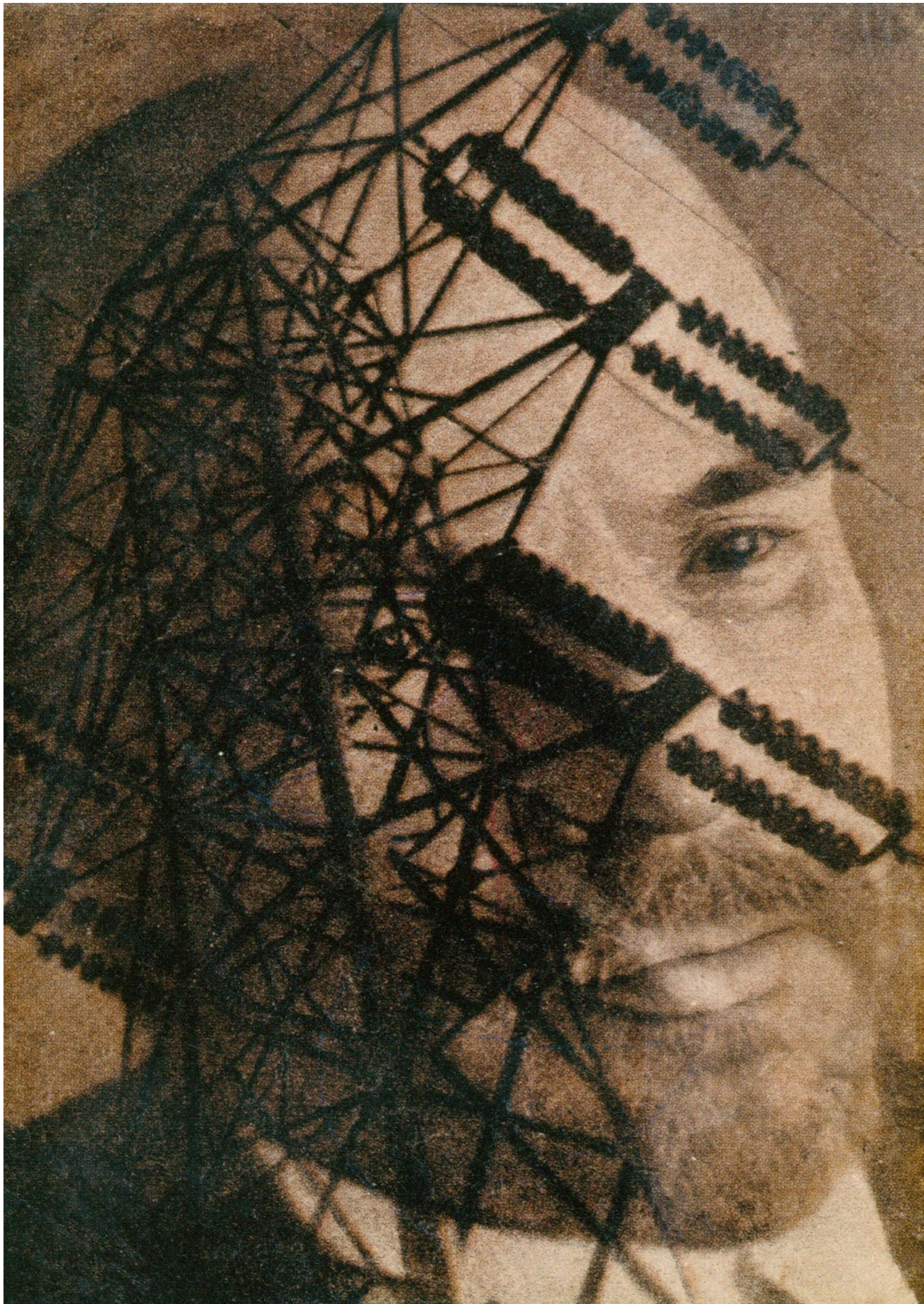
Now, in a suitably completely confined situation (allowing absolutely NO incoming extras, or NO releasing of outgoing products, the situation must only be due to the collection of laws present, and for them to affect what happens there must be the relations between the various laws. For, different laws might require the same resources, and hence, somehow, compete for them. But, if this were so (remember in a totally isolated and confined context), what would be bound to happen over time?

If we assume that Plurality is correct, the laws cannot ever change, so either the position will settle into a stable, random set of oscillations, OR it will become a static situation with maintained amounts of all of both the laws and the present entities too.

Yet, for the latter to occur, the composition of the Domain would surely have to be of a precisely appropriate composition from the start.



Hydrogen Wave Function



Otherwise, such a Stability would be impossible, and the actual composition would change over time – it would surely develop.

Now, if the supply of resources could change then the acting Laws may also be less! And, the only stable state would not be totally static, but consisting of repeating cycles of possible processes (close to the supposed ideal, but with a defined minimal composition of both resources and Laws).

Of course, things would be different, if the real nature of Reality was holistic, rather than pluralistic. For, this assumes NO fixed Laws at all. There were recognisable factors, but they were most certainly modifiable as well as always defined by their changing context. This meant that these factors were constantly being adjusted by the context: in effect, they were modifying one another constantly. Now, this allows infinitely more possibilities to occur, including even occasional episodes of totally transforming changes on rare but unavoidable situations.

The conundrum presented by Reality to Mankind was that, usually and for long periods, the factors could appear to be constant contributions, and as a first order of approximation, this was true enough to be useable, but ONLY in such constrained circumstances (in which they did not vary much anyway).

Now clearly, though a holist World can create and evolve, whereas a pluralist World can do neither, the real situation is well hidden behind a seemingly pluralistic, long-lasting façade.

For those who dispute this analysis, they have to explain, “How do totally new laws emerge?” – as in following the Origin of Life on Earth, for example, or even more inexplicably, those governing Thinking following the Origin of Human Consciousness?

How could such things merely be different mixes of unchanging mechanistic laws?

And, perhaps most important of all, how do crucial processes like resonances and recursions, not only occur, but also sometimes produce the entirely NEW?

The indisputable Fact of actual, Qualitative Development cannot be explained by mere complication.

And, the assumption of Fixed Laws, implies that they were always there implicitly from the outset

I always remember Lenin’s demolition of Wundt, who took that exact line, by taking him back to much lower forms of life and asking if there was a consciousness even then, and indeed “A Worm’s Eye View!” [See *Materialism and Empirio Criticism* – a critique of the philosophical stance of the scientists Poincaré and Mach, written by V.I. Lenin].

We, clearly have to explain why a probabilistic approach can be effectively used in a holistically varying World. For, that seems to be a pluralistic approximation taken from the common and extended stable periods, which, on initial inspection, always give the appearance of being fixed, but which always ultimately give rise to short, sharp interludes of dramatic, transforming change too.

Illustration opposite: *Gustav Klutsis, photomontage of Lenin commemorating his campaign of electrification (1925)*



## Reality and Man's Probabilistic Conception of it

What seemed to be required was a meaningful connection between the real, holistic World, and the consequent possibility of some probabilistic methods of revealing useable relationships.

But, let us be absolutely clear, it isn't Randomness as an intrinsic property of Reality that produces laws, but the multi-factor nature at each and every level, which together can, in the right circumstances deliver patterns that, could be revealed by statistical methods.

Now, this has become extremely important because the current dominant position in Sub Atomic Physics places Randomness as the defining feature of absolutely all phenomena at that level (including the supposedly ubiquitous "Quantum Fluctuations" for example). And, such, in Quantum Theory, even "produces" man-organised "laws", which supposedly distribute probabilities throughout all positions of a virtual wave pattern, and thereby allow these to be used to deliver predictions.

What has happened is that pragmatic and intelligent Man found ways of revealing relationships via multi-measurement statistics, and thereby, philosophically, ultimately inverted the usual causal relationships, and made randomness and statistics as the "primary causes", instead of merely being a man-devised rig.

Clearly, the questions are, "Is this legitimate? Can we make formal probabilistic laws the "producers" of Reality at that level? Or, is it, once again, a mathematical version of the World, where formulae alone drive Reality, and make everything happen?"

We are all well aware of the origins of statistics and probability, as they occur in multi-factor situations, where many, often contradictory factors can, overall, produce a fairly simple final relation, which we can use profitably in desired productions.

Indeed. The earliest, historical, scientific experiments carried out in our complex World, could only make sense by performing a whole series of runs and averaging the results.

Indeed, most calorimetric experiments, involving both heat and liquids, were always of this type, and the measurements made were always "statistical" – such as any physical measurement of temperature for example, or the usual averaging of some key variable over many separate runs.

But, when such methods are used, it did not occur to the scientists involved to put these revelations down to an intrinsic randomness of Reality. They knew that many simultaneous contributions were occurring, and in time they would expect to get-down to those component causes, and be able to investigate all of them - one at a time.

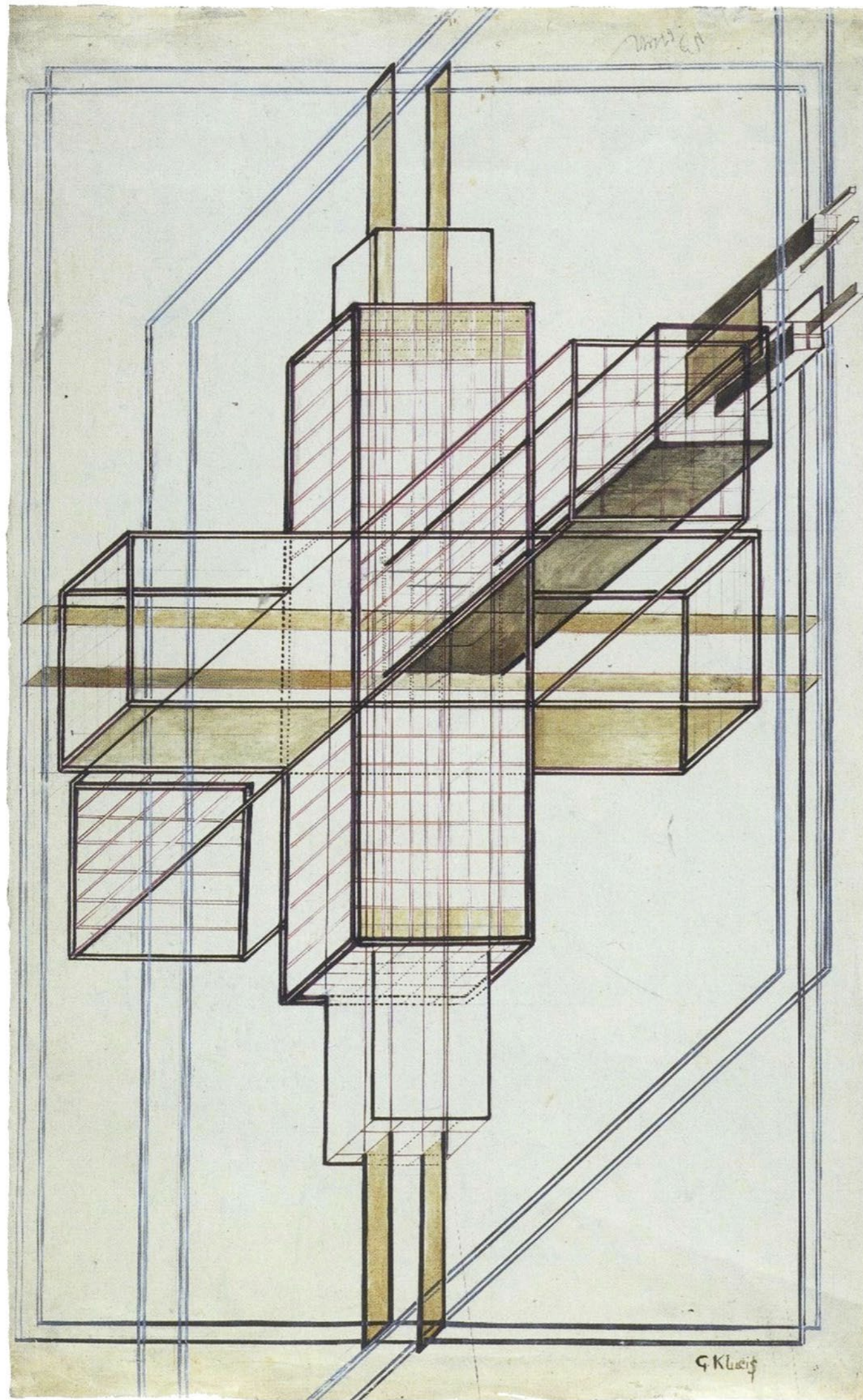
But, we also have to consider Man's current inadequacies in such investigations. Man never was, and still to this day cannot, alight directly upon Absolute Truth. He has always had to make assumptions and define principles to help him interpret exactly what he obtains in his investigations.

And, though these have been regularly improved, he has, never yet, been in possession of the real premises that would enable a totally correct interpretation. Though, clearly, the most intelligent animal on Earth, he was not evolved by Natural Selection to think about such things. He was, for over 95% of his existence as a Homo sapiens, only an exceptional hunter/gatherer.

His selected-for evolution was not for his ability in abstract thinking, but, if anything, in his ability to arrive at pragmatic solutions to his everyday survival problems. The re-application of his cerebral activities to other, more general and more abstract, questions was a very late development, and even when he did address such questions, he could only do it, while still impregnated throughout by his prior thinking and his brilliant pragmatism – with his, "If it works, it is right" approach, which meant that explanations were nowhere as important, as solutions that gave him what he desired directly and without any understanding of why they worked.

Raiding a village of farmers, and stealing their goods was





a direct and pragmatic way to get what the hunter didn't have, and it didn't involve understanding anything!

So, from the outset of addressing any more general and even abstract problems, the effective pragmatist would always rather "cut the Gordian Knot" than attempt to work out how to disentangle it. Man was always inclined to take the short cut, if available! And, the earliest known means of finding such methods, were always in the patterns that were evident in all areas of Reality that were clearly seen in the forms that they took on.

So, the first discipline to be taken to a reasonably advanced level had to be Mathematical Forms studied in their own terms alone, without any concern for causes. Mathematics was never concerned with why things behaved as they did, but it certainly could, via the evident patterns involved, offer reliable predictions – it could say what was liable to happen next.

Now, this pragmatic approach also soon became dominant, as what would later be called Science began to emerge. For, measurements could be taken, which together indicated an overall formal pattern, and the recognition that the formulations of such patterns, was so pragmatically useful that this side of the investigations soon became paramount. They could be effectively used entirely without any understanding of the reasons for the phenomenon whatsoever.

Yet, if such formal things were all there was, it would amount to a very odd kind of Science – for the vital part of understanding why things behaved (the way that they did) could lead to a great deal more than could ever be delivered by a formal pattern.

And, crucially, the increasing dominance of the formal aspects, in scientific investigations, also had profound philosophical effects too. It seemed to suggest that Reality behaved as it did entirely due to a series of eternal Formal Laws. These Laws were what made Reality what it was! And, clearly, that revision was NOT scientific: it was, in fact, a wholly idealist conception.

Yet, also, from the start of Science, there was always a directly contrary view: there were always thinkers who attempted to explain natural phenomena in terms of the properties of the entities involved. They understood phenomena in terms of their physical causes. And, such an approach was clearly materialist.

Yet, in spite of the contradictory nature, these two standpoints became alternative co-operators in the activity we call Science.

For, in Man's well-established, pragmatic way, he knew very well how to unquestioningly switch between conceptions to find a required solution. The fact that these two were directly contradictory didn't necessarily bother him. He could use whichever was appropriate in their evident circumstances. So, both stances were entertained as valuable alternatives, and hence eminently acceptable!

NOTE: Indeed, this dual stance supported itself increasingly, as USE became the most important outcome of such studies. And, another totally pragmatic partner joined the team, and quickly took most of the credit, as his job was to implement the discoveries of the scientists, by using the formulations of the mathematicians in as many useful ways as possible.

He didn't care about explanations, nor did he attempt to derive equations, but he could most certainly USE them to good effect.

The technician or engineer had been added to the team.

## Development in Isolation?

Contradicting the usual stance upon development, which is forever seeking the causes outwith the system under consideration, let us, instead, consider a totally isolated, situation, which is never contributed-to from without, except for Light and Heat (as with Earth getting these from its nearby star – the Sun)!

For, in the case of that well known body, we know that it must have been aggregated (along with its Sun) from the debris from at least one Supernova billions of years ago.

But, once its aggregation was completed, it would be, thereafter, pretty well isolated from significant external influences – particularly when it came to its development. For, the very same things were happening elsewhere, and therefore increasing the isolation of them all.

Yet, there could, at the earliest stage, have been absolutely NO Life, due to both its contributing components, and the destructive nature of the process of cosmic aggregation. It would be dead as a doornail, including just a range of the possible elements from supernovae, in various states of matter, determined by its available temperatures and atmospheric processes.

It could suffer earthquakes, volcanoes, as well as rain, and snow. Rivers would form and flow into seas, but not a single cell of life would be there.

We have a surprisingly good idea of what the elements involved could have been, both from what we now find on the planet, and Fred Hoyle's brilliant Theory of the Evolution of Stars, of which a supernova was the penultimate, if not the final, act!

So, this being the case, all that subsequently ensued there MUST have been locally created and developed thereafter. The determinators of what was possible could only be from the elements, along with appropriate amounts of light and heat from the Sun.

Clearly, only a planet with such an initial complex composition would have the potential for a multitude of chemical interactions and changes of state.

And, the range of active elements would be extensive. Nevertheless, if, as we know it did, a development were to take place, there must have been conducive changes in conditions to take things beyond a set of constantly repeating associations and dissociations. It would somehow have to transcend a purely mechanical or chemical set of possibilities.

We, justifiably, assume that initial destructive impacts would ultimately subside into more settled circumstances, so, from a boiling tumult of molten rock, it would gradually change to have a still molten core, but with a hard crust and a substantial gaseous atmosphere.

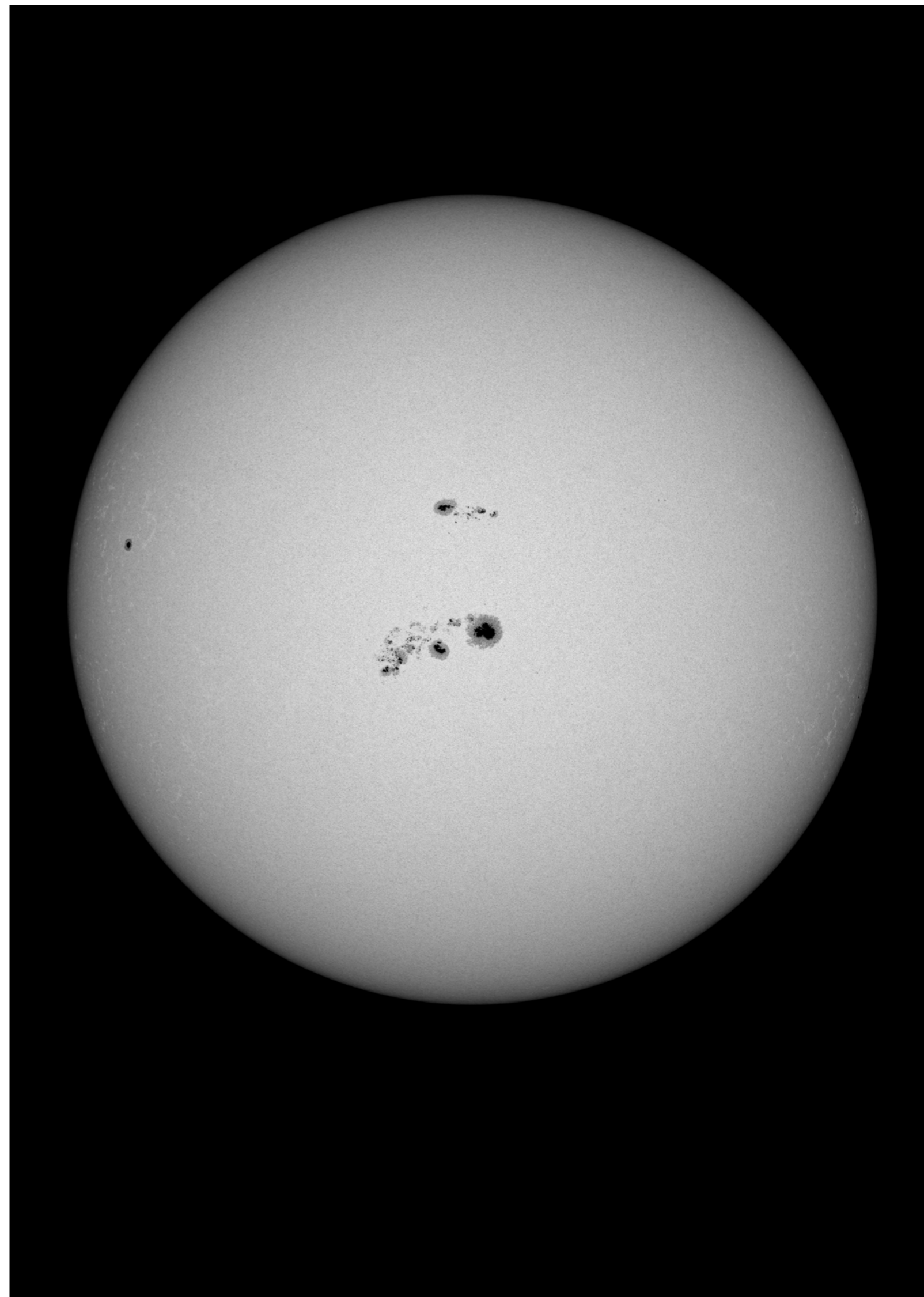
Also depending how near it was to its star (the Sun), it could have in ideal circumstances all three phases of Matter present. The most likely liquid (if temperatures were appropriate) would certainly be Water, as it is a simple compound of two of the most basic elements Hydrogen and Oxygen.

Now the usual explanation, for the History of such an isolated body, is that, from the outset it included a set of Natural Laws, associated with the various elements included. And these would cause the interactions of those elements to produce ever more complex combinations. The likelihood of variation would be increased if the orbit of the planet around its star was eccentric, and if it is also isolated on its axis - for these would deliver regular annual and diurnal changes, and hence cause variations, first in one direction, and then in another (perhaps opposite) direction.

But, we must assume that for longevity these orbits and rotations would have to be fairly constant – otherwise, the situation would never persist: the situation would terminate relatively quickly.

There has to be Time, and lots of it, for real transforming developments to have a chance to become established

NOTE: Indeed, it turns out that Stability is a surprising mix of constant changes embedded in an overall persisting, indeed self-maintained state – a seeming contradiction, and, as such, its incremental changes



alone would never be sufficient to dramatically change the overall state.

So, such a system would always be generally conservative, but would nevertheless display contradictions of various kinds. And, these would indeed result in unavoidable crises, which would, nevertheless, usually be overcome within the current Stability. Though rarely, but inevitably, special crises would occur which would so undermine the situation, as to cause its general collapse, and in such a dissociative interlude – termed an Emergence (or in more everyday language – a Revolution) the whole system would be effectively reduced to nothing (that is in its organisation and controls, but not its primary constituents). And, what remained would undergo a vigorous rebuilding using the same primitives, but in an entirely different direction of higher-level processes and overall controls –ultimately establishing a different, and higher Stability, at a new level.

Indeed, to get real qualitative Development, there has to be both constant changes AND an overall Stability, which, occasionally, will consume itself in radical revolution of change, which will permit wholly new processes to occur for the first time ever!

I always consider that Stanley Miller's Experiment in a totally sealed system, which contained (as far as he knew) the primaeval gases of the early Earth's atmosphere, which was delivered of ONLY a consistent inflow of heat and nothing else. And, in only a single week, the liquid contents, at the bottom of the total isolated apparatus, turned a brownish-red, which was later analysed to reveal the presence of amino acids (which occur in the DNA in all living things)

Of course, how much time would be needed to emulate the History of the Earth? In such a one-to-one in time set up, it would take billions of years to deliver something significant, so such a method has its drawbacks. But, clearly, sequences of processes would be made possible, if and only if, the contents were made to move in currents about the internal space (driven, of course, by a changing flow of energy from without! Left to chance, the time involved would be colossal, but what might cause significant changes?

If we limit ourselves to only the concept of mere complication, we will explain nothing of that we know has actually occurred on planet Earth, for example.

Indeed, if that were the only principle involved, the changes would simply grind to a halt, or at best cycle around a limited series of states.

What must be essential for real development is, perhaps surprisingly, the entirely contrary process of dissociation. For, this ALONE would allow alternative systems to happen as replacements for previously well established, but now dissociated processes in given situations.

If what had been previously built was now likely to be immediately dissociated, then, very quickly, a large variety of very different constructions would happen, and only those capable of withstanding dissociation in a given situation would persist.

And an oscillation between dissociation and construction would SELECT the more resilient processes, and, finally, instead of an ever-persisting oscillation, there would be ultimately a persisting replacement of old interactions, by entirely new ones. So, in effect, the possible outcomes would be those within a new persisting Stability, at a higher Level. And, thereafter, we would get not only the interactions of primitives that survived the general dissociations, but also new ones and, significantly, a whole new generation of interactions involving all participants.

Clearly, though not to do with Life (Evolution), a related process for non-living processes, but still involving selection would occur.

NOTE: Elsewhere this pre-life extension has been defined in detail under the descriptive title *Truly Natural Selection*. Clearly, all of the non-resilient processes would never get beyond the intervening melee.

Indeed, even the production of relatively inert products - like rocks, could, thereafter, influence what changes were then possible. For, they could deliver niches and holes, where some protection for delicate products could be temporarily found, and these could in the long run enable the survival products, which would otherwise perish.

Let us see what we are trying to discover in the possible development of entities in an enclosed World. First, cyclic changes due to annual orbits and diurnal rotations would allow oscillations between different states.

Then, if both constructivist and dissociative processes were possible, we would, once again, get multiple changes over short time periods for many varieties of associations to be tried.

With variable resilience, these oscillations would allow many more possibilities to occur, and in such an ever changing context, the most resilient would be selected for, and persist. Such developments would certainly involve Levels of organisation, and wholly new Laws would be being created as the new levels persisted.

Notice that supposedly eternal laws at the primary, simplest level DO NOT direct development. They do provide a necessary basis, but, most certainly, do not contain, within themselves, the vast possibilities that do eventually appear and persist.

The properties of the primaries are important, but Reality is NOT Reductionist: it is not only individual relations that matter, but how they are distorted by context, and how complex mutually affecting mixes transform one another to give an overall effect.

It is the constant re-cycling that, with a given content, selects the most resilient! It is both the oscillations and the associations and dissociations that always "change-the-Game". To think that a mere backwards causality will explain everything is surely a simplifying form of self-kid?

Notice how these considerations take us from an entirely pluralist conception of Reality, where Fixed Natural Laws produce everything by mere complication, into a very different alternative, entirely holistic conception, where laws are at multiple emergent levels, by a process of "Natural Selection" (not unlike Darwin's ideas on the Origin of Species, but NOT requiring Life to happen). Selection does take place but on the basis of resilience rather than success in reproduction.



## Re-establishing Our Thought

The result of our deliberations thus far, has taken us to an unavoidable conclusion.

And, this is that the currently universally employed pluralist stance can no longer be sustained, as it is both clearly mistaken, AND, crucially, has also brought human understanding to a most important impasse that must somehow be transcended.

But, to simply switch from a pluralist approach to reality now to a consistent holist one is impossible.

Indeed, though individual holistic explanations may be agreed to, where it makes immediate sense, (as it was with Darwin's Origin of Species), those so convinced do not immediately abandon all other conceptions or approaches. They simply cannot do so, for most of these have been built-up over long periods of time, and have proved both useable, and dependable.

In most cases, the pluralist assumptions, although wrong, deliver the goods. It is only in the exceptionally rare cases of real Emergences of the entirely New that this approach invariably fails, and does so dramatically. For, naturally, it is the pluralistic view that dominates the majority of our conceptions and methods.

Our ways of thinking were historically locked into the basic assumptions of Plurality, and a mere handful of effective uses of Holism will never suffice to elicit a complete changeover.

After all, Mankind's greatest talent has always been his pragmatic ability to accept, and effectively use, all kinds of contradictory concepts, merely by switching the conceptual ground to the other alternative, whenever the first choice fails. It is, after all, one of the most powerful features of intelligence.

Nevertheless, we do have a major problem! This clever pragmatism affects us all – even those who are convinced that they have converted to being a holist. Changing mentality, completely, is like the captain of a giant oil tanker attempting to turn completely around, and head in the opposite direction. He can turn his head and see

what is behind him, and even understand it, but can he then afford to cause the immense ship to turn right around, when he already knows he can get to where he is going by staying upon his current path? No, the answer has to be, "Certainly not!" – at least in the short term!

For example, this writer has been a "professed" Marxist (and hence a holist) for most of his life, but he is also a physicist and uses the gains of that important science all the time – all of which is quite definitely pluralist in its assumptions, principles and conclusions. And, as they work, in the appropriate contexts, he uses them "as is". And, it has taken him most of his life to finally turn around most of his conceptions and methods of thinking in to a coherent Marxist and holistic stance. You cannot just choose to switch: what is required is the development of a comprehensive understanding of absolutely ALL that I know.

Mankind was never evolved to place consistency as paramount, or to strive constantly for eliminating contradictions. Indeed, we survived and even prospered, because of our undoubted pragmatic willingness to maintain directly contradictory premises, and use each where, and when, it evidently fitted!

In spite of Zeno's famous Paradoxes concerning the contradictory concepts of Continuity and Discreteness, it did not change general human thinking at all, and it even took almost 2,300 years, before the point was made again, and taken further, by the German Philosopher Hegel.

And, even today, in the current Crisis in Physics, we find Theory foundering once more, upon that very same "rock"!

To stop being a pluralist, and become a comprehensive and consistent holist can never be simply the result of a won argument, but only by a gradual realisation of the severely flawed, hidden premises that we depend upon in our thinking, and, crucially, organise-for in our investigations. We have known for a very long time how to farm situations under study to guarantee that a pluralist approach will work – but such is NEVER

possible for Reality-as-is! The necessary complete Revolution was certainly initiated by Hegel, when, in his specialist area of Thinking about Thought (almost 200 years ago), when he began to realise that all, yes ALL, our systems of thinking were inadequate.

Now, this conclusion is not, of course, a judgement that they were always useless, but definitely erroneous in their essential premises, such that the common bases of our usual standpoint would always lead to pairs of concepts that were unquestionably totally contradictory.

Each of such a Pair could seemingly not both be true, even though they had been derived from those very same premises.

Now, Man has had to actually invent his used methods of thinking, and in this process he arrived at assumptions, simplifications and even principles that were “correct enough” to suffice in many achievable instances, and hence became the agreed bases for his thinking in general. But, when he arrived at the dreaded Dichotomous Pairs of totally contradictory concepts, he simply kept them both, and switched between them, to use the one that delivered in a given situation.

This method certainly worked.

But, to those who sought Absolute Truth it was both inexplicable, and very troubling indeed. How could contradictory conclusions arise from the very same premises? The answer, as Hegel finally revealed, was that the assumptions, principles indeed, the full set of premises were, to an important extent, incorrect.

You could, indeed, get by, pragmatically, by selectively using such derived concepts, but there was always a **limit**, and hence at some point, NO further logical progress would be possible without the dumping of the old premises, and defining of a much better set to replace them.

Interestingly, Hegel also realised that none of these new premises would be sufficient to deliver Absolute Truth. In fact, the best that we could get out of our corrected bases, would be a larger measure of Objective Content than previously, but NEVER Absolute Truth!

It was, I’m afraid, a never ending process of impasses and their transcendence by a correcting review of premises.

## Review: *Defintiely Not Maybe* new scientist (3041)

David Deutsch’s article in New Scientist criticises the use of Probability in present day Sub Atomic Physics, and many of the points he makes are indisputable: the form of use of this area in that context is undoubtedly illegitimate.

But, in my opinion, he does not go nearly far enough in his criticism, for the diversion caused by these methods has steered Physics into a deep mire, and has caused significant philosophic changes, moving this area of Physics bodily from being largely materialist to becoming entirely idealist.

So, what is this area of quantitative manipulations all about?

It is, as with all other Mathematics, yet another method associated with patterns of outcomes as the results of certain kinds of processes, or even more complex systems. It is clearly, a purely quantitative set of conclusions, based solely upon measured numeric evidence. It concerns itself only with such patterns, as are displayed, and hence is concerned primarily with description alone. Why they occur seems to be totally beyond its remit. It is, therefore, a branch of Mathematics!

Now, this is important, because of the confusing relationships between Mathematics and present day Science.

For, in spite of radically different premises, and particularly, philosophical ground, these two disciplines have become closely bound up with one another: they are now permanently “joined at the hip”, which hinders their forward locomotion dramatically. It is a real wonder they don’t regularly fall flat on their faces, and the means by which they avoid this negates BOTH of their original purposes dramatically. On studying them in their own different terms alone, it is remarkable that they have ended up such an inseparable couple, for their affirmed grounds are almost directly opposite to one another.

The scientist’s remit is to try to understand Reality, and finding out why it behaves as it does.

The mathematicians “already know” the answer to that question – it is, “Reality acts as it does, directed solely by quantitative laws, which can be completely expressed in extremely useable equations (which they have spent millennia extracting from Reality).

Now, for centuries, the relationship between these two disciplines was entirely pragmatic, in that succinct formal equations (descriptions) of phenomena (extracted by carefully arranged experiments) were very useful. But, when asking the scientists’ own crucial questions, such as, “Why is this so?”, and, “What causes Reality to act in this way, in these circumstances and with these active contents?”, the mathematicians’, “Obeys this law!”, is nowhere near adequate!

So, the formulations delivered to the scientists by the mathematicians of their measured data sets were definitely useful to scientists in attempting answer their key questions. But initially, at least, they did NOT subscribe to the mathematicians’ belief that they acted in the way they did “because they obeyed the Natural Law, as encapsulated in the given equations”. They sought their answers elsewhere in the physical world of substances and properties. Nevertheless, the equations were a superb way of, as the Americans would say, “doing the math!”

The mathematicians, meanwhile, began to extend their remit! More and more, they felt that it was their work, which was answering the physicists questions, but, totally without reference to concrete entities.

“All that is required to explain Reality are the formal relationships as Natural Laws – there from the outset, and totally unchangeable throughout.”

And, more complex situations were merely delivered by larger mixes of these laws. For by using them, they could not only explain the past, but also even extrapolate into the future. For example given their equations, one could predict eclipses and many other phenomena to the exact moment of occurrence.

They were, of course, the idealist alternative to the scientists' materialism. They had become Natural Laws, which were presumed to drive Reality, and, alone, caused it to behave as it did.

The scientists couldn't swallow that: for they were usually materialists, and, therefore, always sought physical and chemical reasons for all phenomena. But, they often used the mathematical equations, as if they were driving laws, and that was clearly incorrect – for it hid the omissions unavoidable in the restricted form of experimental situations, and the certain fact that if those conditions were significantly altered, very different outcomes would be unavoidable. Looking first to the equations was misleading!

Clearly, a major impending impasse was unavoidable, and it happened in the early 20th century, when Sub Atomic physicists, en masse, abandoned physical explanation entirely, and embraced equations in the guise of Natural Laws as the drivers of phenomena.

But, these were equations of a new type! Not only did they involve probabilities in ways never before suggested, but they were back-to-front, in that the confusing data collected in the various examples of so-called Wave/ Particle Duality, were rigged into invented forms – using wave type equations to be used in an entirely different way – to deliver the probabilities of a “particle phase” being in various positions.

There was NO explanatory evidence for this trick, but over collections of runs, they DID match what occurred. It was a typical mathematical type frig, but now, it had become a causal law, with absolutely NO other explanation provided.

Now, the crucial thing about Probability is that it can be used when you have absolutely NO IDEA why a particular situation delivers a given pattern of results.

The consequences of this “lateral, conceptual slip” were significant, Just as mathematicians had looked only into Form for any reasons why Reality behaved as it did, physicists too began to do similar things: they looked into particular kinds of data sets, where the tail appeared to wag the dog, and increasingly turned to exclusively studying only such “tails”.

You can, indeed, construct a short cut based solely upon formal data, using a formal, mathematical system, based originally upon Games of Chance (dice and playing cards), which assume what we might call “perfectly random behaviours”.

We were able, therefore, to apply these methods to natural areas of phenomena, where the underlying, multiple causes that approached this, were assumed to also be “perfectly random effects”.

It isn't Science, of course! [It is Mathematics, and really only for use in appropriate circumstances. For, it delivers Nothing with regard to real Understanding.]

Mathematicians, over literally millennia, had become increasingly adept at devising “frigs”. After all, they had had a great deal of time to try different forms and consequent methods, on a “suck-it-and-see basis, so they could carry on until they got something similar, and then perform their usual “fitting methods, until they got what they required.

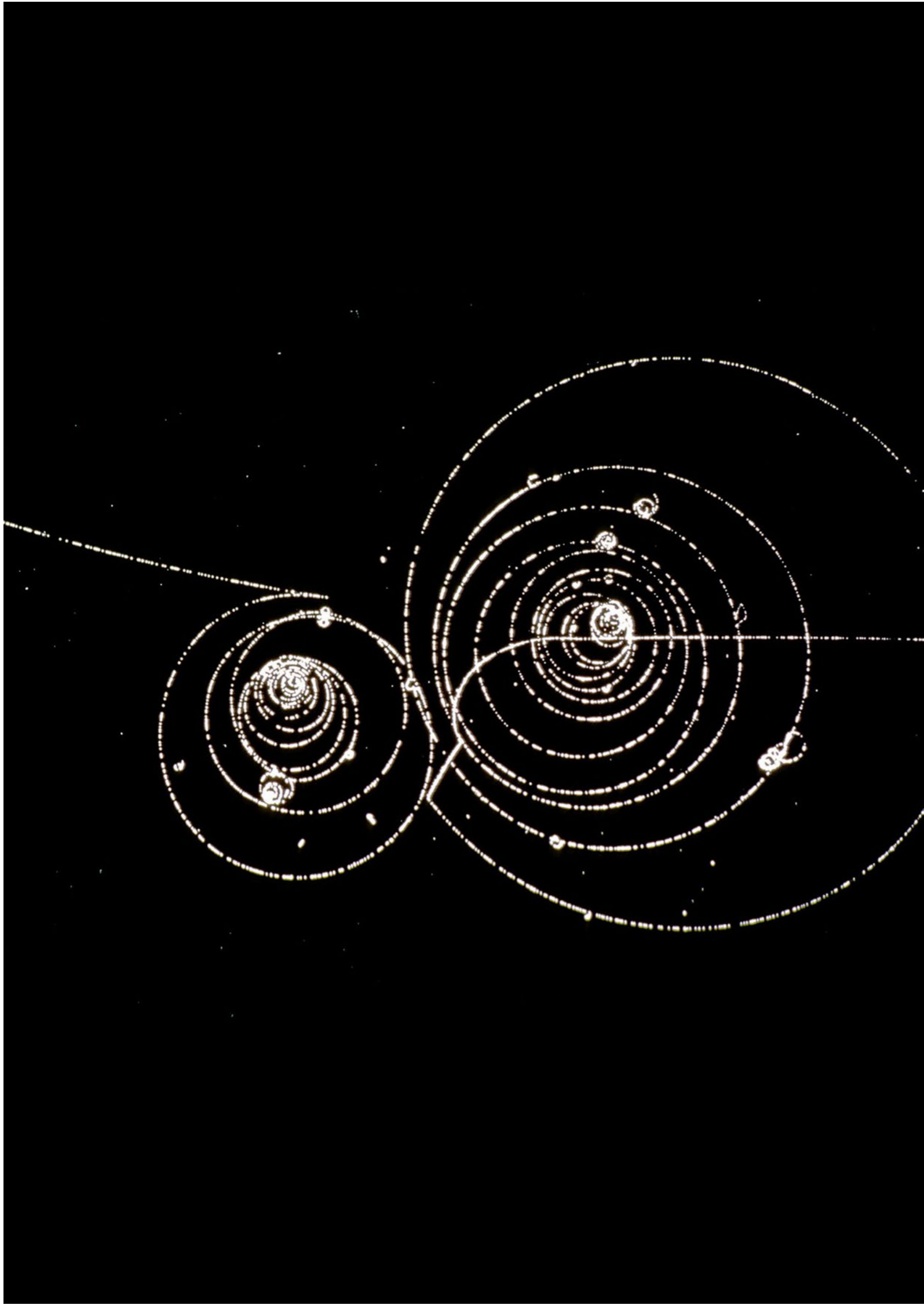
So, these were never to do with why things behaved as they did, but only how things could behave in a range of very different contexts, but could nevertheless produce something useable.

The mathematicians would call it a “method”, whereas a scientist would smile and call it a “frig”!

Let be absolutely accurate: these people were NOT finding answers to the question, “Why?”. Their researches were solely concerned with FORM alone, and where it came from was irrelevant. Andrew Wiles did very similar things in his “Proof of Fermat's Last Theorem”, and though it was legitimate there because the area was wholly to do with Form and nothing else. But, to do such things and insist that they are Science is wholly reprehensible!

The line of methodology had been outlined long ago with the means devised by mathematicians to more clearly illustrate relations, via methods such as Graphs. And, they became very good at employing infinite algorithms based upon the geometry of Graphs to find “frigs” to solve difficult equations, or deal with rates of change (as in the Calculus).





Indeed, a whole “Area of Mathematics” concerned with iterative methods was produced, which much later led to Fractals and Mathematical Chaos.

But, the slipping over of such formal tricks into supposedly explaining concrete Reality, was totally illegitimate.

All these methods have ZERO to do with Cause in the Physical World: they are pragmatic tricks only! The Pragmatic Intelligence of Early Man was coupled with the formal tricks of the mathematicians to terminate further progress in Physics at the Sub Atomic Level.

And, there’s the rub!

The physicists making Probability a cornerstone of Quantum Theory have actually converted it into something else! They assume that in the area they are concerned with Randomness is NOT the result of multiple, competing physical causes, BUT, the primary causing engine for all phenomena at that level!

There is absolutely no evidence, anywhere, for such an assumption, except the fabled, “If it works, it is right!” Pragmatism.

Now, David Deutsch, in his article *Definitely not Maybe*, makes many good points, but he doesn’t stress this last crucial point – It is a way-out philosophical assumption that the motive forces for all phenomena at the sub atomic level, and hence, via Reductionism, are the bases for Everything above that level.

He does insist correctly however, that because of this basis for Quantum Theory it TERMINATES the development of Physics Theory. It makes any further explanatory development impossible.



## Thinking New Thoughts

When thinking about anything, it is absolutely crucial that we are also aware of our current basic premises. But, this isn't normal, at all!

We rarely, if ever, reiterate our bases: we established them long ago, and now take them for granted.

And, in most ordinary situations, this will be OK, but, if we are attempting to solve a seeming intransigent problem, then this could definitely lead us away from a possible solution.

Our assumptions and believed-in principles - our premises, dominate all our thinking methods, and if the problem being addressed is beyond those premises, we will get nowhere!

For, these premises definitely and dramatically filter and even modify what we consider in order to prepare them to fit! The ideas are effectively "normalised" by these premises into changed, idealised forms, which will then be consonant with those bases, and, of course, our usual methods of using them.

We cannot avoid this, and what is more, these premises will always be inadequate, particularly in new areas of study. For, regardless of what improvements we make, they may get better, but they will never deliver the Absolute Truth.

So, it would indeed be stupid to just say that they are wrong (as the give up now you'll never do it crowd are known to conclude), because that just isn't true either.

Whatever they are, currently, these Foundations for subsequent Thought, will always have become established, because they deliver more Objective Content (parts or aspects of the Truth), than what preceded them, and also can, upon carefully chosen and maintained ground, actually deliver to a significant extent.

So, we shall not judge them in terms of whether they are "right" or "wrong".

Indeed, to make such absolute conclusions will most certainly be counter-productive, for in transcending them, and establishing the NEW, that valuable process is never a total replacement of the premises of the past. Our improvements must always retain what was sound in the old standpoint, and, also, know why they delivered, and in what range of circumstances.

Constructive innovatory thinking is like looking at both the studied World and we, via an improvable, but always distorting mirror. And, our consequent achievements are as much about ourselves, as they are about the things wearer thinking about. We change ourselves and our capabilities, as we transcend each and every impasse, and gradually improve our conceptions of Reality.

Illustration opposite: *Vivian Maier, Self Portrait (1954)*





## What is Law?

To start with, how can a Law be primary?

For, such an idea infers that the Law pre-exists everything else! And, if that is rejected, it must, itself, have been caused by something, which existed prior to it: a Law must be the result of other physical effects, residing in things.

The trouble is that Key Laws are also invariably considered to be eternal, and that, once again, pushes them into the primary position again PRIOR to all following consequences –throughout-Time!

Clearly, all such conceived-of Laws are constructs devised by Man, based upon real world experience, of course, but considered as the primary driving essences of all observed phenomena.

When experiments are carefully arranged to reveal patterns in a given behaviour, the investigator strives to reveal some overall, determining reason for what is being observed and extracted, And, ONLY having his quantitative measurements to inform his thinking, he makes any found relation between the evidently most important parameters, as an actual Causing Law.

It also fits in with Mankind's own self-image, as the prime causer of his local context. So, more generally, some sort of super-causer with all embracing powers must have made these Laws to organise its designed, self-moving World.

So, at base, historically, Man delighted in Laws as evidence of a Creator, like a man, but infinitely more powerful and wise.

Hence, in spite of principles to the contrary in Man's own studies of Reality, which, in contrast, had attempted to reveal properties and physical causes, the age-old preoccupation with Law never went away.

Indeed, in appropriately farmed circumstances, such Formal Laws could not only be found, but also actually USED very successfully.

From Man's early history, he had learned to be a consummate pragmatist – using whatever he found to his advantage, without any understanding as to why it occurred: he simply discovered what he could use, and did so. And, any inconsistency in his conceptions could always be totally trumped by his success in his methods of use.

Indeed, in these periods, when he was able to do little else, such a flexible, pragmatist approach served him well. Indeed, Man spread over literally the whole of the planet, with only such pragmatism, served, of course, by his remarkable intelligence and adaptability.

But, the development of Man, was never, and could never, be just an incremental one, with the amassing of such knowledge, and that alone simply delivering further progress.

Indeed, throughout Man's long history, many extended periods of scarcely any development were common. And Man's worldwide distribution was as much a counter to such failure, as to his success – as he was forever seeking the promised land, where everything he needed would be easily available, and he could flourish unabated! And, though he, regularly, thought he had found it, it was always temporary, and he always had to move on when his latest "solution" failed.

The most certain failures in Man's development were in the guaranteed and often major impasses, precipitated by his unsound thinking about his world and the consequent incorrect assumptions and premises, which he arrived at. For, without progress in his thinking about causes, his arrived-at assumptions would finally let him down and bring things to what seemed to him to be a final halt!

And, as it turned out, it would only be in transcending these impasses by new and concerted thinking, that his assumptions, steadfast principles could be corrected - opening the door to further developments.

Further methods of thinking were regularly becoming absolutely essential.

Now, these had not been selected for genetically in his evolution. He was selected for entirely as a hunter/gatherer, so somehow, Man had to remake himself to continue his development.

Now, these impasses occurred at all sorts of Levels, and some were easier to transcend than others. But, the key error - concerning Natural Law, was undoubtedly the BIGGY!

Yet, in spite of not overcoming this major error, Man did amass many solutions to individual problems, and the key to such an un-integrated set was, of course, his brilliant pragmatism, which had been selected-for. Many solutions, when thought about, did not gel with one another, and wisdom became knowing which ideas to use in what circumstances.

## Theory or Form? which reflects a self-moving reality best?

What exactly is Scientific Theory?

One thing is absolutely certain – it is never the Absolute Truth! But, it can, indeed, approach the Truth in some meaningful way. It is, in fact, a series of steps in an infinite sequence of ever better attempts to get as close as possible to that ultimate objective. And, in this, Man has found a couple of valid approaches.

He does it, first, by a series of methods he applies to his currently studied areas of Reality, which are carefully organised, so that they reveal significant parts or views of it, and display them in such a way that that individual relations can be extracted, from a carefully farmed context, and then studied in those limited terms alone!

The major means of achieving such gains also involve the application of extensive simplification and idealisation, of what has been extracted, and, there can be no doubt that these, when applied in an appropriate way, do, indeed, reveal something of the studied content that we have sought.

The primary tools in this phase are:-

1. The isolation of a selected context, and
2. The appropriate manipulation or farming of that context, in order to reveal as clearly as possible just ONE formal relation, and to then map its measured data onto one of the pure forms that mathematicians have been studying for millennia.

Now, we have to be absolutely clear what is involved in such methods, or we will make significant errors in the ground that we assume for such techniques!

The key processes of simplification and idealisation are the means by which Mathematics had always been extracted from Reality, and hence, it should be no surprise that when it was applied in controlled experiments, rather than merely by observation, similar forms would be evident, and a joint approach could be made to what was being revealed.

But, such means are clearly extremely selective, and most certainly discard many important contributing factors in every situation studied in this way, so that something targeted would dominate, and hence be clearly exposed. And, it doesn't stop there, for that forced factor is then treated separately to how it actually performs in Reality-as-is – the real-world unfettered version that we are keen to understand.

The mathematicians in their long preceding history, were NEVER dealing with actual Reality, but with what pure formalisms they could extract, - the idealised forms, that they could then study, but only in their own terms alone!

Clearly, when similar methods came to be used in Science, it was inevitable that the two disciplines would arrive at compatible extractions, and the fitting-up of measured data to the pure (ideal) relations of the mathematicians would definitely be on the agenda.

NOTE: Let us not forget this crucial post-processing, where the general constants of the mathematicians forms, were fitted to the obtained data to give particular constants for the supposed Natural Laws.

But, such investigations, alone, would never be sufficient, and what would be achieved, would not yet be Science! For along with any formal considerations, the scientists also required a very different set of features – they required to explain phenomena in terms of the entities involved, and their intrinsic properties, as well as the purely formal descriptions.

The extracted forms gave useable descriptions, while the explanations strove to find out WHY things behaved as they did. The achievements of these investigators were contained in the Analogistic Models, which they managed to devise.

Now, once again we must be very clear! Having both simplified and idealised the sets of measurements, by fitting them to a pure formal equation, they were NOT, as yet, revealing the full Truth!

They were both describing and explaining things in particular contexts only. It wasn't Reality-as-is, but, on the contrary, a tailored situation that had been dealt with, and the achievement was merely a model of THAT!

And, hence, some of the models turned out to be far from any real world situation.

A brief study of James Clerk Maxwell's analogistic model of the Ether, from which he derived his Electromagnetic Equations, will show what I mean. But, nevertheless they could contain enough Objective Content – aspects or parts of the truth, to allow progress to be made.

Such achievements are always based upon a set of assumptions, simplifications or even principles about the area under consideration, and these were inevitably insufficient, yet, nevertheless, they could, and did, contain more aspects of the truth than what had been the case previously. So, they could, indeed, deliver some areas of progress.

But, such premises, though they did tend to some developments in understanding, were ALWAYS also barriers to progress, beyond a certain point. Their inadequacies would always, in the end, lead to major, and seemingly irresolvable problems.

Indeed, the most puzzling aspect was that they would inevitably lead to Contradictions, which common sense seemed to indicate would be impossible!

And, no developments seemed possible, until Hegel actually revealed that mistaken premises would always lead to Dichotomous Pairs of contradictory concepts, each of which totally contradicted the other member of the Pair, yet could separately be used with confidence in special circumstances.

Hegel showed how such things were endemic, and that the usual "solution" was to keep both and switch between them as circumstances demanded.

NOTE: Indeed, this rig is now a cornerstone of ALL computer simulation programs, where when to switch is indicated by a given parameter passing a threshold value. NO implicit reasons would be necessary, just the "rule" of when to switch.

Needless to say, such methods only work in relatively stable situations, as soon as things get really complicated, even they fail catastrophically. (I can say this with confidence as I was in this field for 40 years).

Thus things could be achieved pragmatically, but not theoretically – The line of theoretical development had been stopped dead, and, again revealed by Hegel, they could only be restarted by a detailed study of the complete set of premises involved, and their replacement by something closer to the truth. And, this is the second, fore-mentioned and vital stage in this process.

Now, all the above was inevitable, so, it would be no good merely saying that what we were doing was wrong! You simply wouldn't be aware of the inadequacy of your premises until you banged into a Dichotomous Pair. And, even then, the process of correcting the offending premises was no simple task. Indeed, between Zeno's Paradoxes and Hegel's explanation of them, 2,300 years elapsed!

Interestingly, the seeking of better premises and consequently more appropriate Analogistic Models was never easy. And, even then after managing that step, you would still know full well that even that would also, in the end fail you too – and yet another cycle of criticism of premises would again be necessary.

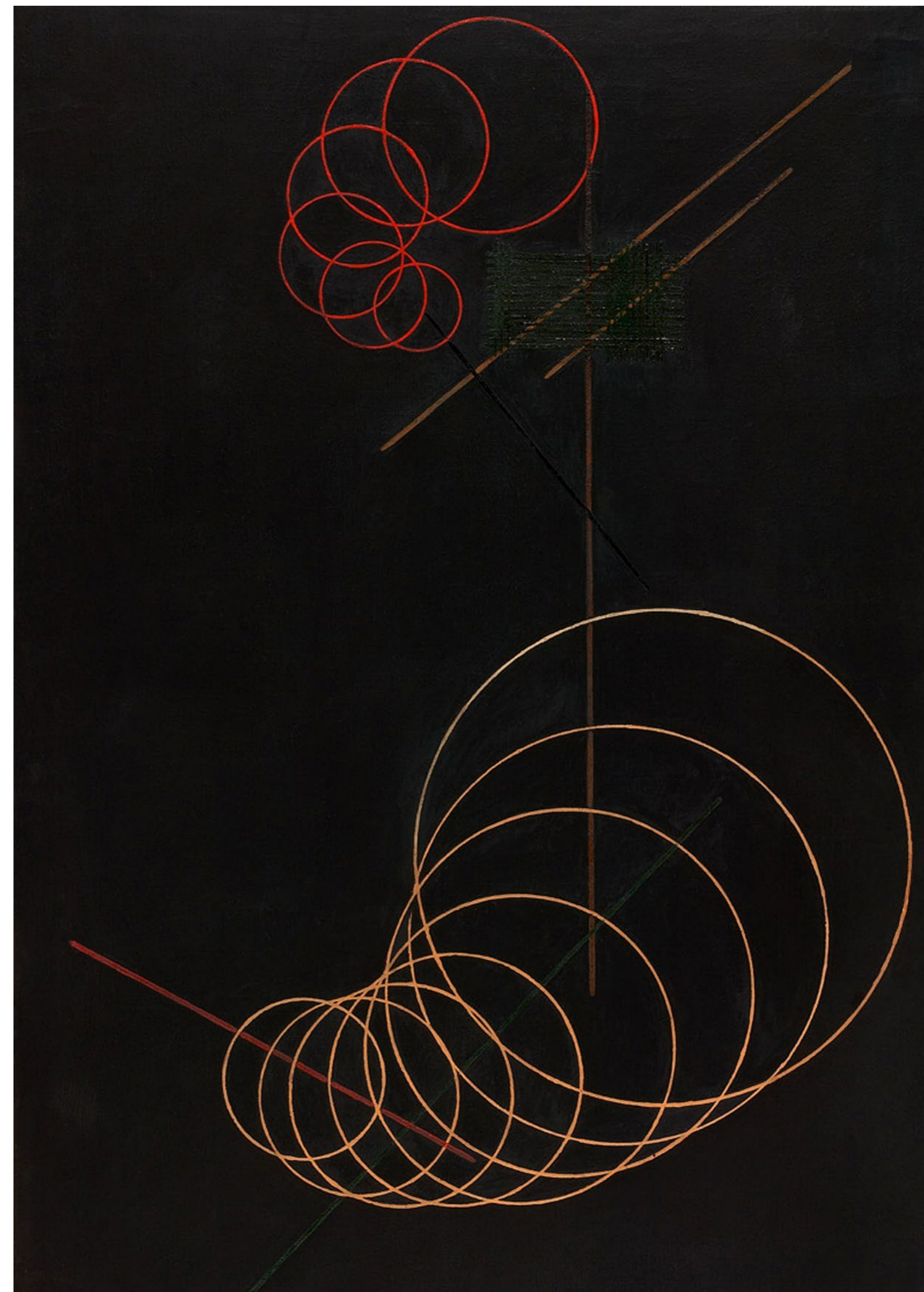
The famous Myth that Reality loves Simplicity is rubbish.

It is *we* who love simplicity, and feel that the simplest will be the most true!

That is NOT a description of Reality, but of Ideality – the realm of Pure Forms alone!

Of course, as that last comment exposes that the "lowest common denominator" of such approaches are the purely formal equations of the mathematicians, and these are generally not "improvable" because they are only commonly occurring descriptions of appearance: they never attempted to explain anything, only to describe things formally, in one or another of many common patterns.

So, they were clearly pragmatic too –rather than being any kind of explanatory Theory.



And, therefore, what was truly remarkable in the 20th century Crisis in Physics, was that the theorists totally abandoned their long-standing remit completely, as being impossible to carry out in the Sub Atomic Realm, so that, thereafter, everyone would subscribe to the pure formal relations – the equations, as if they were the driving, causal (?) laws, which made Reality what it was!

Yet, of course, they could never be that.

The essence of those was to strip the phenomena of everything except a single quantitative formal description.

Of course, such a mammoth change switched the philosophical stance of Science from materialist one to an idealist one, to match their now dominant Mathematics.

