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THE ORIGIN OF SYSTEMS

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This month's issue deals with the complexity and interconnectedness of natural systems, and our worrying inability to understand them through current scientific methods. As always in SHAPE Journal, we try and chose the work of great and thought-provoking artists to accompany the theory text, not to illustrate the ideas discussed obviously or directly, but to form a parallel but relevant narrative on the core concepts involved.

For The Origin of Systems we chose the work of installation artist Tomás Saraceno. He originally trained as an architect, and his intricate and immersive works seem to literally build bridges between science and art. Saraceno certainly sees the Earth as a complicated and vast system, we must try and understand, describing it as "the fastest vehicle that ever existed". His work is concerned about the threat to natural environments and ecosystems, also taking inspiration from neural communication networks, origin theories, sub atomic physics and spiders.

The Origin of Systems

Option A

by

Jim Schofield

Origins are strange things to consider - how do new things ever come to be? We could start with the beginning of everything perhaps, the Origin of the Universe itself...

Currently, there are two primary approaches to explaining the Origin and subsequent History of the Observed Universe, but only minimally served by its detailed and historical study - Pluralism and Holism.

For Mankind still does not possess the necessary wherewithall yet to construct such Theories soundly. Nor do they, as yet, have either an appropriate philosophical stance or the capabilities and reach to tackle such questions. We are at an early stage of development!

Also, most of the major questions will be incredibly expensive and difficult to investigate properly in the present Economic Structures of our World - systems majorly dominated by colossal Business Interests, and also, impossible without the allocation of a vast commitment of effort and resources. For, it is inconceivable that those in a position to fund such Research, would ever switch their priorities from the well established directions they currently support, and so abundantly financially benefit from! And, to extend Research beyond at-distance-observations to actually going there, and directly investigating the Universe, would mammothly inflate the necessary resources - with only Knowledge and Understanding as the achievable gains!

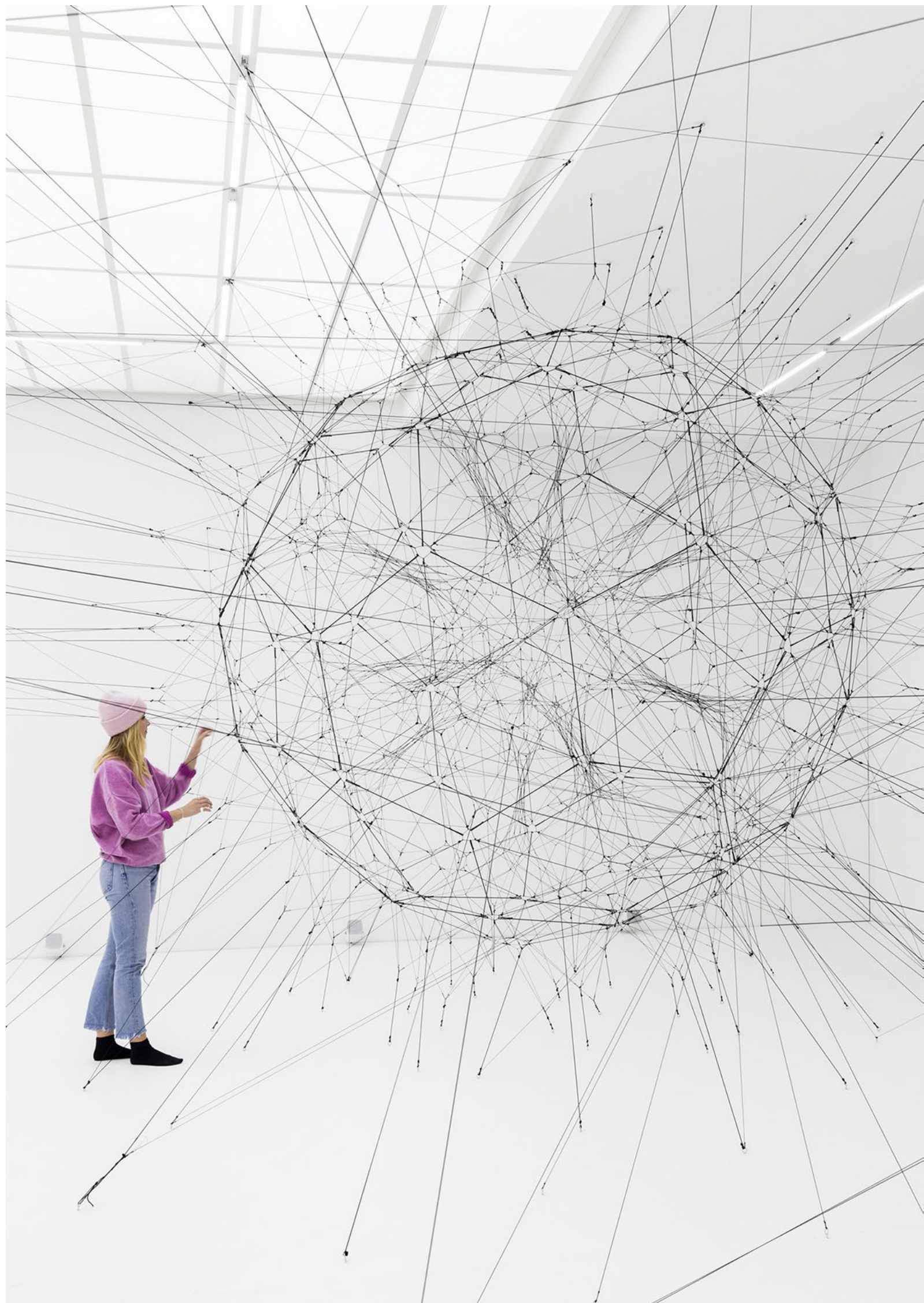
Indeed, some idea of the difficulties involved, are very clearly illustrated by the 50 years of Expensive Failure in attempting to switch the Generation of Electrical Power Production, from the globally damaging Carbon-based Fuels (and the much too dangerous Nuclear *Fission*), to the safer, more efficient, but elusive Nuclear *Fusion*.

And on a much wider scale, the General Funding of Research in Universities is primarily directed by wealthy donors to **ONLY** the projects that will benefit their primary endeavours - whatever they are!

There are, of course, many dissenters from the currently dominant strand in Philosophy within present day Science - the most enduring being the oldest division, being that between Physics Theorists and Practitioners (or Engineers). And, this arose because the Theorists had to devise Experiments, both to reveal concrete relations between Key Variables, and also, of course, to effectively *use* what such experiments delivered. But there was a major problem that both distorted, and, therefore, undermined, such necessary experimentation.

It was the preference that all Physics Theorists had for the route of primarily considering *cerebrally* the Theoretical Relations involved: they much preferred that “much-shorter” route to truth, by using Reasoning. And, for this they needed a universally applicable, common approach, to all the various formal relations that had to be dealt with, and since the Ancient Greeks had long ago revealed just such a Rationality - that of Mathematics - it was used





to develop a coherent, consistent and comprehensive System of Reasoning, which could be cereably and universally applied to All Relations - or so it seemed.

So they took the data from experiments, that had then been fitted-up to produce Purely Formal Equations from the Discipline of Mathematics, and used these Equations as the legitimate results of the producing experiments! They didn't, of course, carry out the actual experiments themselves, for that wasn't their skill! They employed Engineers and Technicians to do that for them: for they too agreed with the physicists' trust in the obtained Equations - for the very sound reason that they used them all the time in repeating the experiments exactly - as a means of Production. And as such they certainly worked!

But, the Physicists' and Engineers' experiments were a very restricted type of investigation! They were never investigating Reality-as-is. The situations were always drastically simplified and rigidly controlled to keep the limited investigated situation absolutely Stable. And that isn't true of Reality-as-is; it was instead an artificially maintained situation, within which the relations did not change qualitatively: the relations were always totally FIXED! And, as such, were actually a Pluralistic Situation, whereas Reality-as-is was naturally-and-unavoidably Holistic - everything happening, to some extent, affected everything else. Most things and All Causing Laws changed over time.

Theorists didn't see this. They were too in love: excited by the fact that Mathematics was wholly Pluralistic, a self-contained and immutable system that couldn't be changed from without. It seemed so perfect. They used Mathematical Rationality in General Reasoning and all the newly emerging Sciences too - wholly illegitimately - which was thereafter adhered to - to the present day.

Now, Engineers are NOT theorists: and their determining tenet has always been that things must WORK - and if they work, we've understood things. Their job was to produce things that worked, NOT to *explain* them. The necessary cooperation has lasted, though with constant disagreements. The Engineers could never stomach the ever-more unacceptable Speculations of the 20th century in Physics, so, finally, an alternative Speculative "Theory" began to be promulgated by a group of Physics Engineers around Wal Thornhill.

And that was the origin of the "Electric Universe" system!

But, even that wasn't the end of the process, for in earnest commencing with Hannes Alven. a new tendency commencing with Cosmic Plasmas at the heart of it, took yet another basis, and indeed Origin, for the present Cosmos, which based everything in the Universe upon Plasmas.

Finally, I must add myself here, whose differences with the now standard Pluralistic Stance in Sub Atomic Theory, I have switched into an attempt to establish a consistent and comprehensive Holistic Stance, that initially foundationally-led to the re-establishment and re-definition definition of an everywhere-present and essential Universal Substrate. This marked the beginning of a wholly new system of understanding, which I term Holistic Physics!

But, the essential enabling change was to extend the set of contributing Elementary Particles downwards, to include already established entities, but now also combined in such ways as to be undetectable currently, yet also capable of explaining many currently unexplained physical phenomena, and as a consequence undermine Pluralistic Science completely!!

In many ways it is NOT a radical set of ideas, as most have already appeared elsewhere, But, the wholly New contributions are in the Holistic-or-*Systems* conceptions, which almost from the original Holist ideas of The Buddha, were always considered to be too complex and continually interacting, to be coped with logically, directly and comprehensively.

The key unexplained phenomena were always those concerned with Qualitative Changes: so the dominant Western alternative, developed in the Greek Intellectual Revolution (at about the same time as The Buddha) which instead made its recently-discovered Rationality of Mathematics the Basis for literally everything else too. And this was achievable, if, and only if, all studied situations were artificially-maintained into Qualitatively unchanging scenarios, both for *Study* and for *Use*.

And, at that stage of intellectual development for Mankind, along with the vast majority of their day-to-day problems, such a restriction was usually extremely *empowering*, as Technology was both more important and intellectually graspable and useable ONLY within

a full Pluralist approach! So, in spite of some major hiccoughs, such as the contradictions revealed by Zeno of Elea in his Paradoxes, the Pluralistic Approach has dominated universally until the present set of unavoidable contradictions have finally demanded a more appropriate Holistic Approach to emerge. But it still has not been easy!

GWF Hegel, the idealist philosopher, some 200 years ago attempted to tackle aspects of Zeno's Paradoxes, in his idealistic definition of what he termed Dialectics, but, being an idealist, he treated contradiction as only an aberration in Mankind's Thinking, rather than being universally applicable to Reality-in-General.

It was his follower, Karl Marx, who realised the profound generality of Holism within his own studied Discipline of History, and began to apply it in the only area where it could be immediately evident: social systems. Here, substantial Qualitative Change only seemed to happen in Social Revolutions. This approach alone seemed to tackle Qualitative Development as it actually took place in concrete material Reality - and this approach became known as Dialectical Materialism.

Now, the problem of the Tempos involved in Dialectical Change could, indeed, be clearly observable in History, so he also applied it, as an essential Process of History-in-change, to then be applied to current crises of his time - the crises in Capitalist Economics, - and started a Political Movement based upon his revelations! BUT, he never was a scientist, and therefore never in a position to be as equally capable of applying these Holistic ideas to any of The Sciences.

Now, I went to University to Study Physics, and was immediately aghast at what I was being taught. For, at School I had been an exemplary mathematician, and after seven years with excellent teachers in that subject, I disappointed them all by realising that Mathematics was NOT equipped to be the basis of anything in the Real World: it was altogether too restricted to actually *explain* anything! And, in contrast, my Physics teachers at school were imbued with *Causality* - reasons why things behaved as they did. So, in spite of my exemplary record and achievements in Mathematics, I chose Physics as my Specialism for University - JUST as they were switching to an almost purely mathematical approach to that Discipline, in the mid-20th century.

Believe it or not, this was the reason that I sought an alternative to the then universally-accepted Copenhagen Interpretation of Quantum Theory. But, in spite of a major search in the main University Library, I could find NO competent dissenters within that subject. When I switched to a more General Search, I found *Materialism and Empirio Criticism* in the Philosophy Section.

It was a criticism of the initial turn to Mathematics in Physics by the French physicist Henri Poincaré and the German physicist Ernst Mach, who had together promoted what was generally termed Positivism, but named by them as Empirio Criticism.

And who was Russian philosopher who had written the critique? It was the Marxist Revolutionary Vladimir Lenin! He later, and somewhat famously, led the first successful Anti-Capitalist Revolution.

Despite this breakthrough, I soon found, that even with advice, absolutely nothing Holistic relevant to my difficulties. So, I had to try and deliver it myself, urged on by many problems arising within my area of specialism - helping researchers across the whole range of Disciplines solve problems in their Researches by dedicated tailor-made software aids created by myself. It wasn't quick, but though I didn't realise it at the time of their creation, several significant problems involved the beginnings of a solution!

The most significant being in the techniques for wedding different types of mutually synchronised, simultaneous sequences via computer-controlled set of visual recordings, which eventually, after an extended commitment solved problems previously considered impossible!

And it was this that reminded me of The Buddha's famed Loka Sutta, in which he cycled-around the same sequences of processes looking for different outcomes to inform him of as yet unconsidered contributions.

The same sort of iterations could always reveal things that were not immediately evident!

ASIDE: Interestingly, school-based experiments are more illustrative of what is being discussed here, compared with any professionally organised alternatives. For, the more expensive undertakings get very much closer to what are considered as the "ideal pluralistic" conditions,

than the amateur efforts in schools. Yet it is the latter that delivers evidently different results on multiple re-runs. and hence reveals more clearly what might be making different contributions.

But in those school situations, the teachers usually assumed that the different results were entirely due to a poor standard of performance of the repeated experiments, and hence suggested merely averaging them to improve the accuracy! But the differing results were caused by unconsidered contributions in the holistic mix.

Such Holistic alternatives are never considered!

Now, such averaging might well bring the results closer to the required "ideal pluralistic" result, but merely ignore any holistic contributions!

But, it is certainly just such Holistic contributions that the New Holistic Laws simply must include and the Loka Sutta means of revealing just some of them, in otherwise tightly controlled investigations will clearly NEVER reveal the more important and rare Qualitatively transforming ones, for which we will need to dramatically extend our means to include all Holistic contributions!

In Part B of this approach I will begin to consider those contributions.



Option B

Now, the time has come to systematically describe Holism. It is about more than just the apparent interconnectivity and interdependence of things.

We must seek a well-defined description in order to see exactly what it will mean to finally establish the most reliable and effective Philosophical-Basis for any Scientific Discipline - such as Physics - without artificially constraining Reality to deliver a much simpler, though easily reproducible alternative.

This will not be simple: as has been clearly borne out by the fact that, if successful, it will be the very first comprehensive attempt to understand Reality as it actually occurs, in well over 2 millennia of 'Science'.

For, the so-called Holistic or *Systems Features* of Reality, turn out to be so very difficult to even reveal, let alone attempt to describe and analyse - for they are absolutely never immediately evident, and, certainly almost never clearly exposed in their often subtly re-formative actions. Indeed, even those supposedly fully committed to The Holist Stance, such as Buddhists, on the one side, and Marxists, on the other - seem to be miles apart in their chosen extractions, from what must be a Common Holist World for them both.

So, we should address such a Dichotomy from the very outset of our task, by describing the reasons for such unavoidable difficulties inherent within the Holist view, if investigated solely without prejudice!

The initial historical attempts have always clearly defined the reason as being due to Holism's unavoidable Complexity, but considering that term's essential defining

role in criticising Plurality, I feel it far better to call it, Holism's Multiple-Mutual-Interdependencies!

Absolutely Everything can Affect Everything Else!

And that feature is NOT only limited to Things. It applies, just as extensively, to Processes too. For both Context and Content are involved.

Indeed, when you believe that you have finally addressed them all, yet another contributor always pops up: and when such has happened already many times, every investigator tends to give it up as an impossible task, and begins to restrict the Context drastically to an easily maintained state, and henceforward always limits subsequent use to that same reliable Context.

This explains the rise of Plurality!

But, that dismissal certainly isn't the case, for the Pluralist approach *hides* a great deal more than it reveals, via its imposed and supposedly "Permanent" Stabilities!

Holism on the other hand generates innumerable purely *Temporary* Stabilities, which frequently trip-up investigators into thinking they are the Permanent and Stable state of things - only to be confused by moving into yet another, different and Temporary Stability... You very soon don't know where you are!

But, one serious-and-able investigator hung-in-there, and for many years, doggedly pursued these problems - BUT, he did have a major advantage: he was essentially an Historian, so he didn't have to depend upon just his own current analyses, for prior History was always

usually recorded for posterity, so he, Karl Marx, was able to see exactly where, at least some of these Temporary Stabilities terminated, and slowly-but-surely he began to make sense of the true Dynamics of History!

And this was greatly improved by his final recognition of Economics as a major determining Factor: so he began to make sense of the underlying Dynamics of History, in terms of Economics.

But the Laws he extracted were NEVER fixed or eternal! Indeed, they changed, or came in-and-out of predominance all-the-time! They had relatively short periods of predictable dominance, before an unavoidable Crisis appeared, and grew ever larger, which threatened the whole Economic System, and radical adjustments, usually elsewhere, in the extended chain of related processes, had to be majorly changed to restore a crucial Balance.

There was NO achievable Steady State!

Instead, Capitalist Economics had revealed something vital about the Universal Process of Development - literally applicable to Everything! Here it was revealed by its greatly accelerated rate.

But it wasn't a Natural Process of Positive Advancement at all. Even with "just-in-time" saving adjustments, the results were NOT for the continuing development of the Whole World System, but only a congenitally unstable part of it!

Indeed, many changes were not considered part of Economic Objectives, and were heading for a series of Existential Crises, which could Collapse the whole established Planet-wide Systems to cause Chaos!

For, when left to itself, this natural process will regularly arrive at a Balance of the whole set of Systems.

BUT here the conscious actions of Capitalism's main beneficiaries are selfishly driving the whole set of Natural Processes into potential Oblivion - with Climate Change, along with many others as the currently clearest indicators!

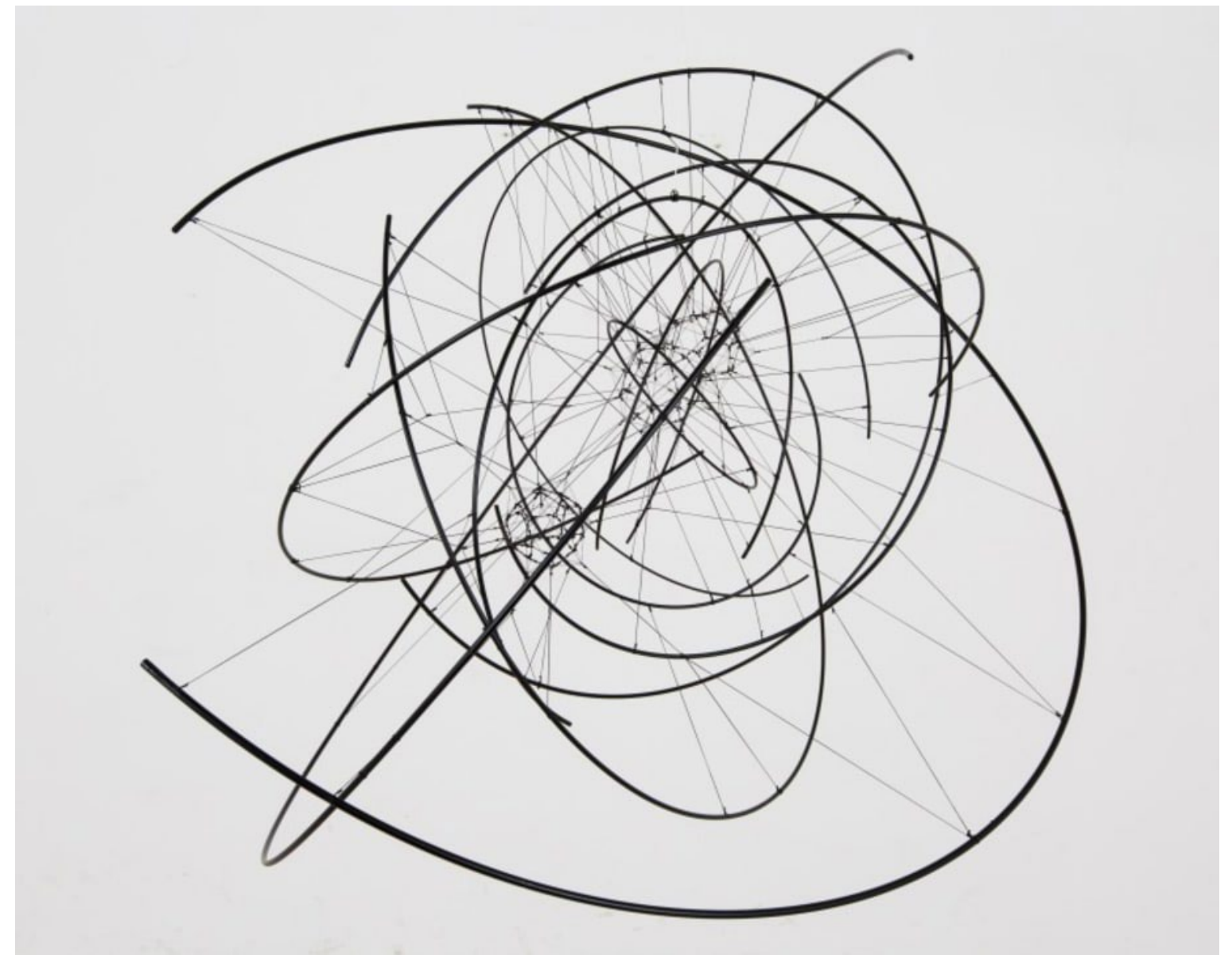
If left to these situations and their directing players, the situation will always end-up a great deal worse than any Social Revolution, that would inevitably be precipitated!

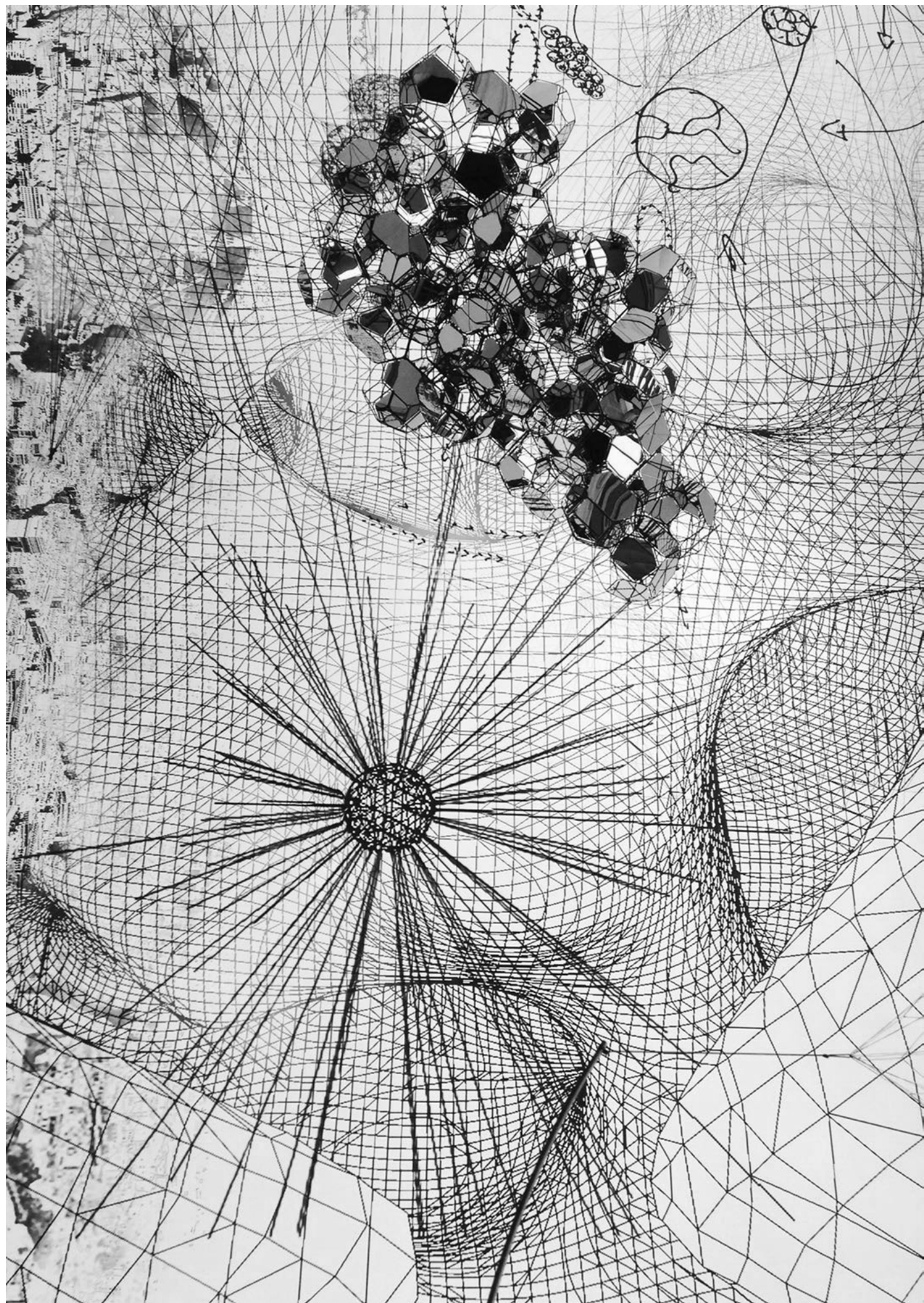
It instead would be a Totally Global Calamity of truly gigantic proportions, that will lead to millions of deaths, and no easy route out of it.

In fact, it is precisely a Revolution that must be strenuously worked for! Nothing less could cope with the Accelerating Swoop to oblivion for the Many, as the Few drivers of the situation look forward to their dual solutions, including the diminution of the lower classes and their leaders - leaving them, they believe, in a sheltered enclave served by Artificial Intelligence and an increasingly mechanical workforce!

And to lead that struggle, nothing but a Bolshevik Type Party, equipped with a developed fully-holist Marxist Theory will do, to address All the Questions of our Times. But, of course, the type of Marxism, as created by Karl Marx, concentrating upon Economics alone, though still important, will never be enough until it extends its remit beyond Economics to encompass Everything in our World including the multiple Existential Crises threatening our continued existence! BUT, openly and clearly as the absolutely essential extension of Dialectical Materialism, that the past's Marxists did not address.

It should be evident that a philosophic Stance AND Political Method including All Aspects of current Reality, simply MUST be undertaken to integrate all the struggles necessary for Success! To this end the third part of this contribution will concentrate upon the New Holism needed to empower us all!





Option C

Now, the alternative Holistic Approach to the overall Development of Reality-as-is, could never be applicable at an observed Beginning - as that is either very long ago indeed, or it never even happened, as such!

The Universe could, indeed, be truly infinite both in Time and Space, and any Origin, most certainly, has never been observed by Human Beings, as it vastly precedes their own Emergence.

But a continuing, if also developing, set of crucial formative processes has been observed (with obvious difficulties) within deep observations of Space, and occasionally has also been re-created on a much smaller scale in the Laboratories of very much later scientists.

However, Reality-as-is is no straight-forward mere Complexity of permanently-fixed components, as the Pluralists see it: for as ever more such elements were added, many Different, wholly-new Joint Entities were regularly being created, which not only produced the wholly New, but invariably also inevitably modified the Old too! And what was produced, in both of these cases, and always had to depend upon, and co-exist with the existing Context. Absolutely none of these were independent of their producing Context.

So, whenever they were treated as such by Man, many errors crept in. So it became the Norm to keep all conditions as totally unchanging as possible outside the actual experimental investigation.

And the assumption that supposedly justified this practice, was the wholly INCORRECT one, that multiple involved Effects merely SUMMED in reality!

And that, in the vast majority of cases was wholly mistaken! The Normal Pluralist Science, which assumes a total independence of all changes, as a generality, is wholly wrong when we examine Natural Systems and their Evolution.

So, how does it work so-obviously-well in Everyday Production? The answer is that the Conditions in an Investigation are always precisely replicated within Production too! So, all is well? Well NO!

For, the truncated Processes and Forms used in Production, were assumed to also be The Absolute Truth in Theory too. And, of course, it is no such thing! For, as Theory was limited to the manipulations from multiple wholly Pluralist Equations, it was guaranteed to be WRONG.

Remember, Plurality is a Man-devised Simplification, and NOT the Nature of Reality-as-is. And, such restrictions majorly straight-jacketed "Reality" into a wholly Pluralist State, with a relatively small number of affectable variables, which was fairly easily maintained and investigated, BUT NOT at all Reality-as-is. And as long as all Investigations and Productions were kept within those limits of that "Comprehensible World", it could be both Controlled and Maintained, via Technology.

But, of course, such Control is not always possible, so Mankind's World was kept within those strict limits almost exclusively, Until, that is, more and more areas of Reality impinged upon Human Beings with literally no means of changing things. So, "No-Go" areas and ever more unresolvable Contradictions abounded.

And indeed, the universally celebrated Intellectual Revolution of the 5th century BC, which had initially established the commitment to Plurality in Ancient Greek Philosophy, had also “cemented” these mistakes into a universally accepted stance, ever since, which in the main greatly advanced Mankind’s Control and Development.

It was NOT going to be easy to replace!

And the really crucial Holistic replacements to Plurality were almost impossible to discern within Man’s Natural scale and tempo of things: for outside of those the key areas which clearly conformed to Holism, were consistently outside of Mankind’s Natural Range of experience and Understanding!

Indeed, only one rare area of Changes develop at a strictly Human Rate (because, in the end, it was totally precipitated solely by the conscious actions of Mankind) were in relatively rare Social Revolutions!

Marx’s application of Hegelian Dialectics to this area of study is one of the few areas in which Human Beings began to get a handle on how Systems naturally evolve and collapse.

What certainly didn’t happen here were constant and surviving moves to increasingly Stable Situations. For, on the contrary the sought-for situations were such as to precipitate ever-further Crises, and always new critical situations, only ever terminated by arriving at Wholly New Circumstances, with their own retinue of very different final destinations. And the reason they could be understood by people, was because they alone were the active forces in the changes: NOT it must be emphasised by their individual *ideas*, but by the cumulative actions as part of the rising class.

But, nonetheless, Marx still had a seemingly insurmountable task to establish this New Approach - literally all of current politics was firmly NOT in Working Class hands - all intellectual concerns were controlled by the dominant Classes - one way or another - and they aimed to keep it that way!

Indeed the whole intellectual Life of Society was in their hands, and not only History and Politics were increasingly going to pot!

Even the few ostensibly Marxist Parties were effectively infiltrated and re-directed into “Safer”, “Non-challenging” directions, absolutely always committed to maintaining the Status Quo to some degree! They formed an unwitting but crucial part of the Social System balancing itself and preventing its dissolution.

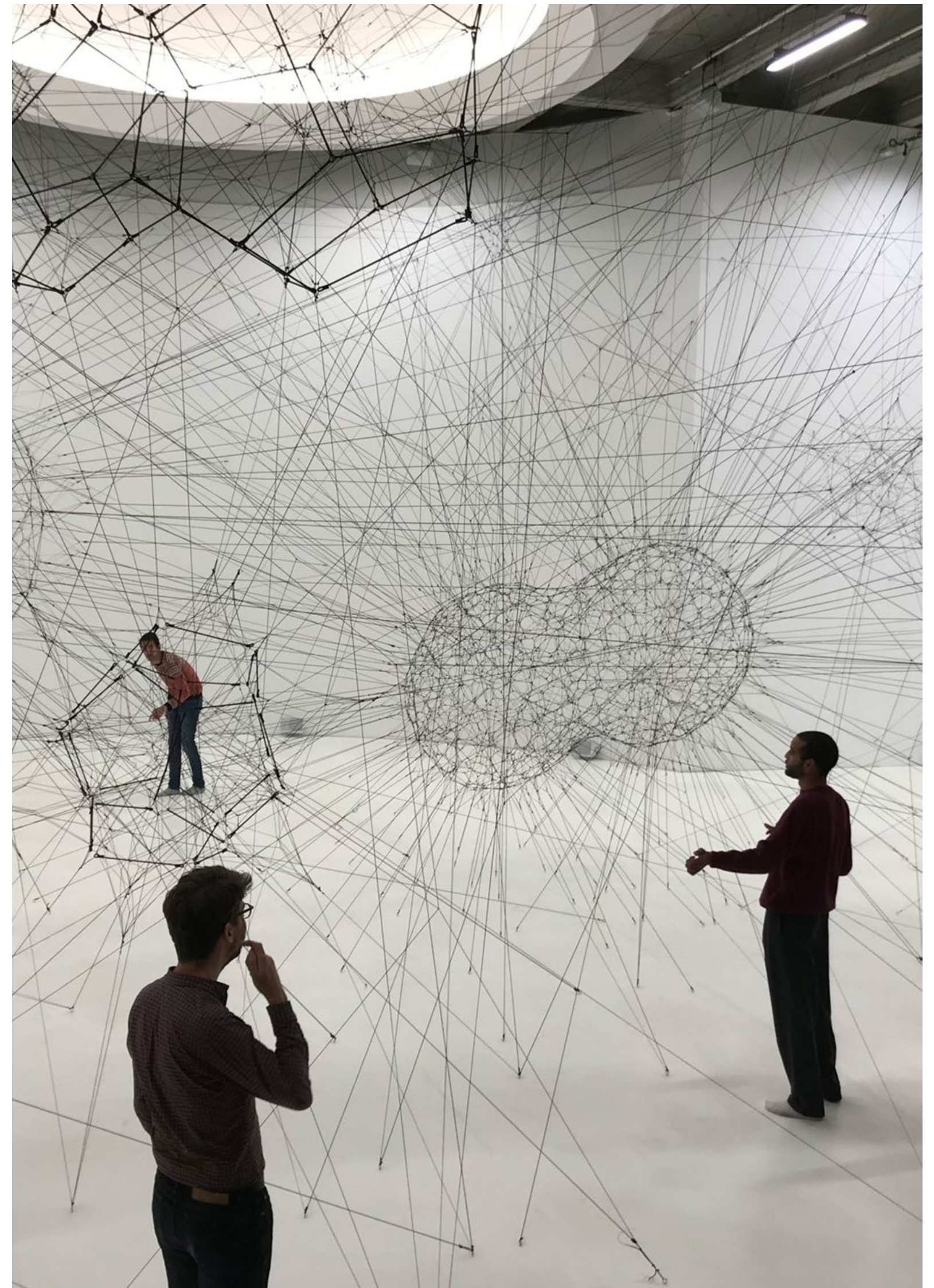
Marx himself knew very well that his Dialectical Materialism would change things completely, if ever more widely adopted and employed! But, neither he NOR his very few co-thinkers tackled the crucial areas of both General Reasoning, or any of The Sciences! This created a very limited view of Reality for the Marxists.

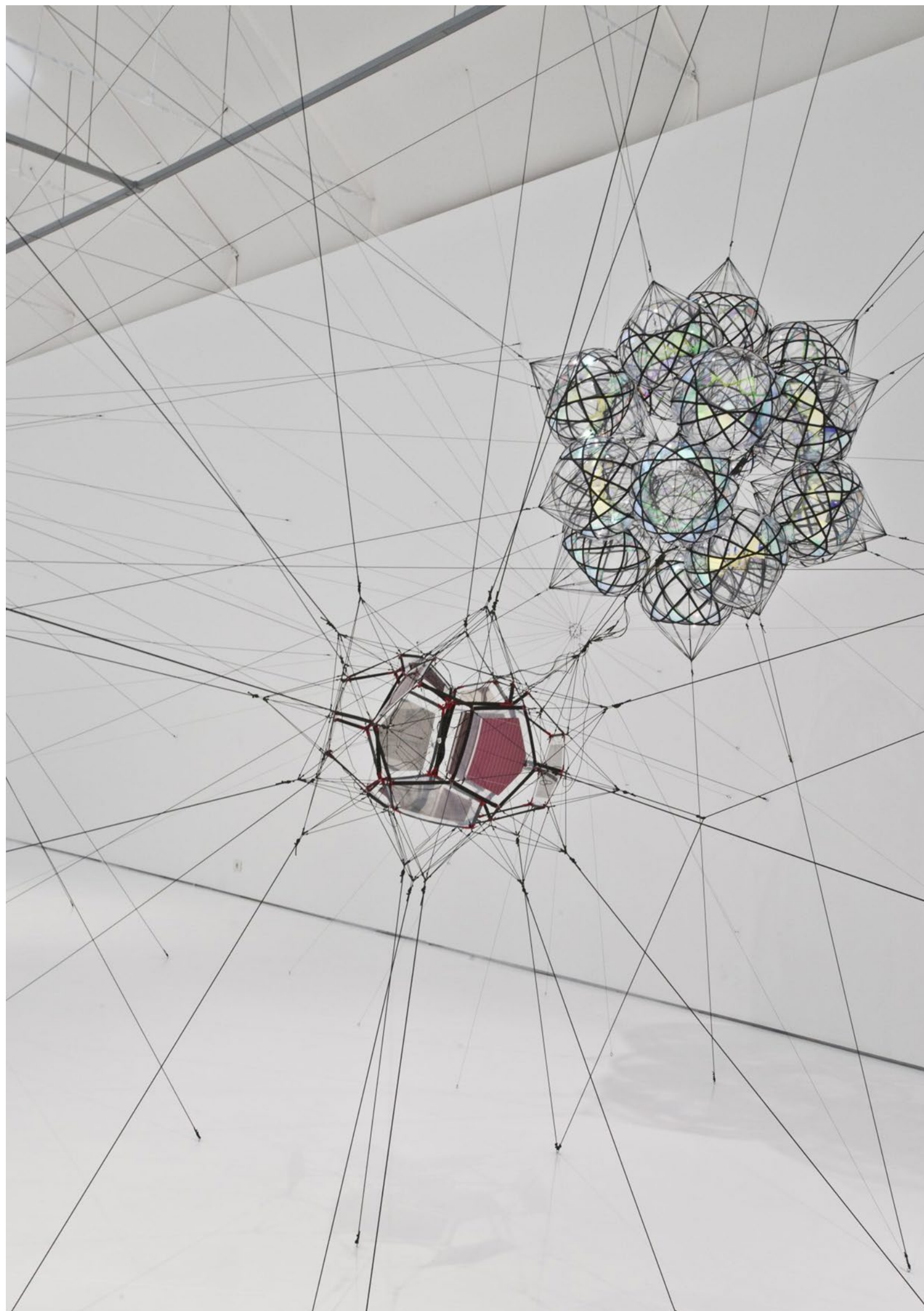
One unavoidable reason was primarily to do with Tempos! Social Revolutions sped along at a pace which Mankind could not only cope with, but also then effectively be only ones capable of intervening in, when only they could conceive of was happening!

But in spite of a major growth in many different Disciplines, NO actual ways of intervening at the required Tempo were generally available! All new contributions, even the most original, were automatically restricted to the Discipline’s own usual and well-established Constrained Pluralist Specialisms. For even Marx could not effectively expand the Method beyond Economics (in spite of Engel’s attempt at *The Dialectics of Nature*) and they NEVER broke through to Dialectics as the essential Method required across the Board - a method for understanding all dynamic Systems.

From Marx’s death in the 1880s to the present day some 140 years later, nobody, not even supporters and followers of Marx, have even been able to extend the application of Marxian Dialectics to any other Discipline whatsoever: UNTIL, that is, the author of this series of papers, who is a qualified Scientist, realised where Marx’s Approach could be remarkably-and-revealingly applied, in revolutionary ways of applying them to various disciplines, including the study of movement in Dance Education (Bedford Interactive Research) and later Substrate Theory in Physics (SHAPE Journal).

With the first of these examples, it was again to do with things happening at a “Humanly-appreciated-tempo”, but ONLY via wholly new methods of using “congenically-inadequate recording means” in innovative-and-combined ways.





In the research, both Film (comprised of detailed still and discrete frames) and Analogue Video (then comprised of blurred continuous mini-movies) were shown to deliver only a small fraction of the content involved in complex-and-expressive Dance Movements, but when shown combined together - unified by simplified-and-integrated animations from one, actually superimposed upon the other, and all synchronised together with other appropriately different views, the dynamic content finally became deducible!

It was certainly a surprising place to make the philosophical breakthrough, but it should have been realised long ago! For though the tempo was right for Human study, the skills and understanding were limited to a small group of expert performers, unifying great creativity and intuition, with a very esoteric training. My co-researcher was a ballet Dancer from this world, and had become a great choreographer and educator, but nevertheless managed to communicate sufficiently to this scientist to enable a powerfully creative partnership to flourish successfully against the odds!

Clearly, the next steps will again be in various human activities (at the right tempos), but will need to create interdisciplinary partnerships, as we did.

Holistic Systems Laws

As a software designer and computer research lecturer (my old day job!) I was very interested in how systems worked. But following that prior fruitful period in movement research, my Computer Programming activities had to be terminated, due to disabling health reasons. However, I could still *think* dialectically, so it was very clear that much still remained to be done upon the Philosophic Front. So, this researcher switched to investigating Holism in general - particularly in its Systems Implications, which because of the historical limitation entirely to Economics, had never been thoroughly investigated in the most important, and as yet totally unaddressed area - Science.

My original specialism was actually Physics, so I embarked upon the long task of wholly re-reading and re-casting Pluralistic Modern Sub Atomic Physics, in a completely Holistic way - concentrating primarily upon Laws, which were no longer considered as both Fixed-and-Pluralistic, but which so evidently were mutually affecting of one another, and hence forever-qualitatively-

changing, in Reality-as-is! The obvious place to start had to be A Major Critique of The Copenhagen Interpretation of Quantum Theory, and its replacement by a Truly Holistic Alternative! This led to the development of *Substrate Theory*.

The Key to revealing the major Holistic influences, has to be within Social Revolutions, when all the important changes took place, which removed things into a set of New and Innovative situations, which in the course of such Revolutions transformed things entirely into a Different Qualitatively Surviving scenario!

These would be Economic Processes, but they would open the door to a Wholly Different Society, and would have Analogues across all the major areas (conditions permitting)!

The task would have to be to extract from such a total Turn-Around, a more general idea of the Dynamics of the whole process, which should throw light upon how significant Change might establish itself elsewhere, as it clearly did on a major Scale in Economics. And that kind of research did ultimately bear significant fruit: the sequence of Crises, which could and finally did lead to the Total Collapse of the Old, and the consequent Creation of the New, did indeed become evident! This became my *Theory of Emergences*.

The task then was to transfer those dynamics correctly into other Disciplines and see how they behaved.

All areas of applicability would not be as dramatic as in the Economic Sphere, as that certainly underpinned the establishment of everything that happened within it: BUT Revolutionary Changes could appear at all possible Levels of Reality, and would be made evident by such investigations.

But Scale will undoubtedly have a major effect upon what would be involved, and the tempos would also change significantly.

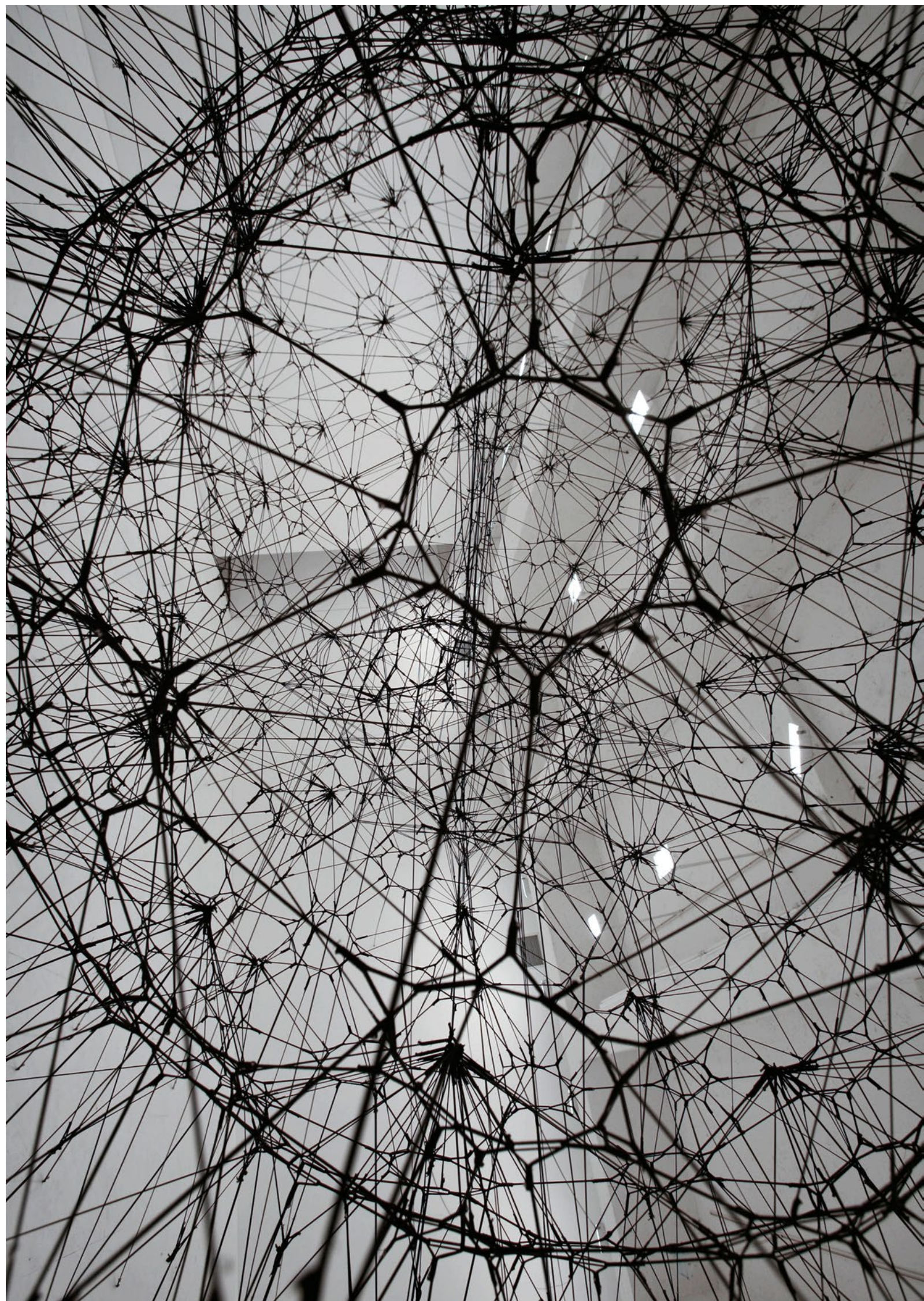
What has to be taken into account, with such changes of Scale is that though very similar processes would be necessarily involved, they would be being applied to Different Substances - having the same effects but delivered differently! Remember, what we are considering have to be effective at every scale from the Microscopic to the Cosmic!

So what will be the Agents at different Levels? They will involve very different Substances delivering very similar changes at different Tempos...

One of the major discoveries of the 20th century was the Commonality of all these simultaneous Processes, at vastly different scales and involved substances - as was initially established by the Physicists who recognised the same Filamentary Processes (Plasmas) as in the Laboratory, as also occurring in Space - at huge scales - which though differing both in the composition and in their interactive Tempos, were essentially the same in both!

Now, finally, we must address all these effects, particularly, and uniquely differently, in a Systems or Holistic way, so it will be appropriate to commence a new paper, with a very different perspective. As this will both enable a new approach to be established: single independent processes will no longer suffice!





Option D

This restart has been absolutely essential, as the crucial factors now to be addressed, for the first time here, will relate the actual and necessary non-independance of all the multiple, and simultaneously-acting Laws in a System, which will no longer be assumed to be discrete, separable and immutable. And hence, we will also dispense with that other entirely Pluralist Assumption, that such laws merely SUM in their combined joint Effects.

For, Laws will undoubtedly *change* one another, qualitatively, in some way. Yet, contradictorily, they will NOT, in spite of this, produce an infinite set of possibilities, but, instead, arrive at wholly new overall Systems - indeed Forms of Stability - which though always temporary to a degree (some could last billions of years), will, nevertheless, ultimately arrive at very similar, if differently-arrived-at, resultant states - across the board.

So, it is becoming clear, that a great deal has now to be explained to accomodate all that above synopsis implies! For such *Systems Processes*, as I will call them, do NOT deliver the usually assumed nature of any of the universally-established at all! For, the Real multifareous World of Reality-as-is, is invariably considered altogether too much to cope with, so all situations are extensively limited in contents, so as to also limit the consequent processes involved to a Single One for study. For, though everyone agrees that Natural processes do NOT occur singly: the whole purpose and methods of Pluralist Science are to attempt to make it so, and hence, in those arranged-for conditions, treat all Laws as acting independently, and hence effectively alone!

Now, of course, this is due to the well-established Pragmatism dominated by an absolutely necessary simplification, to make any ensuing Productive Technology totally viable! But, there is yet another aspect of Current Science, namely its formulisations, necessary in order to to enable it to also be used as Theory, to cereably predict outcomes via Thought-and-Laws alone!

But, that should also generally be strictly confined to only Reality-as-is, in order to ensure Real Comprehensive Conclusions - applicable everywhere: and that is absolutely NEVER done by Science in its current form.

However, in much earlier separate Research (*Truly Natural Selection*) by this investigator, into the processes occurring that lead to the Origin of Life on Earth: it was clear that, in Nature, Laws always act simultaneously with many others, and consequently have varying effects, depending upon their simultaneous-action along with others, and in varying contexts.

Now, commencing with their initial Contexts, individual Laws would require necessary resources, and produce consequent products, thus invariably continually varying the consequent Contexts involved too. And the actual abundance of the required naturally occurring resources, as well as the generated products, would be primarily-affecting individual Contexts, all the time - though strongly moderated by the most naturally abundant resources. So, in attempting to predict overall outcomes, it became necessary to consider outputs from one process delivering a resource needed for another - so with sufficient abundances, actual Linked-Chains of Processes would invariably be built, while also delivering side products, which could be used in sequences of others.

Now, considering Science-in-General, in the many tasks of revealing Causes, there would be produced, initially, an impossibly complex undertaking (if addressed directly in Reality-as-is). For all situations would naturally constantly vary considerably, and even the seemingly most likely situations were still too complex to be comprehensively dealt with.

Mankind has learned from many many failures not to even attempt this, and to make use of things that do not Change very much, or, alternatively, control a situation so tightly, that most factors are held still, and only the necessary few used or investigated.

Indeed, for literally millennia, the only really useful substance, because it could be reliably shattered to produce a very sharp edge, was the brittle stone called flint. And the commonest useable material was wood - the dead, and so relatively unchanging, product from trees. For 100,000 years the only "Science" we seemed to develop was entirely embodied in "How Flint was knapped to produce effective tools and weapons!" Over truly vast periods of time, a small set of productive processes were developed!

Explaining things was always impossible - myths and stories were invented instead. But very slowly, *achieving* things did become possible. Pragmatism Ruled OK?

Now, this meandering introduction, is considered absolutely necessary here, because, in spite of Mankind being involved in a whole series of very different Revolutions, which greatly enhanced their achievements, without radically transforming their Understanding of "Why things behaved as they do!" Indeed, we still achieve a great deal without ever Understanding Why.

Now, all this will undoubtedly be condemned as nonsense by many, but I assure you it is actually the case - for Mankind had many unique abilities, which were, in themselves *Revolutionary*. Emergent in their implicit potentials - not least in their remarkable dexterity and languages - no creature like this had ever evolved before. Human Beings are uniquely placed to begin to understand the complex systems of the Universe, but the journey has barely begun.

At home, we have a remarkably intelligent cat, which can do remarkable things, from getting safely onto and off the roof of our house, to frequently catching and

releasing insects-on-the-wing with its mouth, to extend its entertainment! The cat certainly seems to possess some intelligence, it learns about its environment and adapts to it - but it can *make* absolutely nothing! And it has practically zero language.

The possibilities within Evolved Living Things, are truly amazing, and the privileged Human Beings, very soon put their fruitful lives down to their Intelligence and Language, but often have zero actual skills at all! The remarkable actual trajectory of Mankind's Development upon a thousand crucial Levels, is unknown to them, as it is to ordinary folk too.

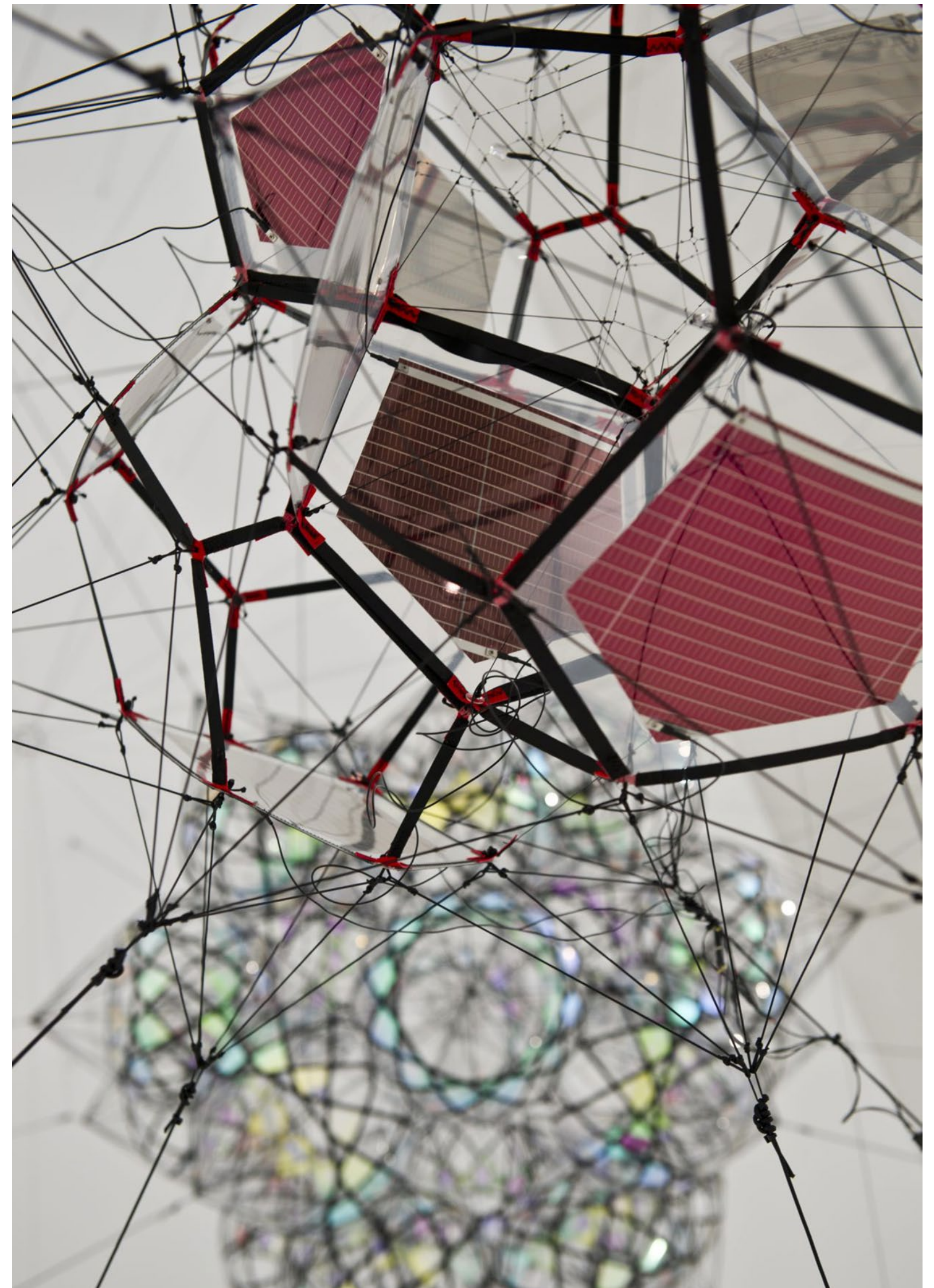
So our "so-called" Explanations, are often far from the mark, due to their being totally unaware of the Real Full Processes of Development, behind Reality. And this leads to many mistaken conclusions, rarely addressing the absolutely vital, self-made and inevitable mounting Crises of our remarkable History, in all its causes both positive and increasingly dangerous!

So without, the Key Revolution in Real Understanding, that we await, this remarkable Development, this unfathomable work of the Evolution of Matter - culminating in us, in Human Beings and in this society - could easily end in an existential Catastrophe.

And, the most crucial area in this trajectory has scarcely even started, because it is currently impossible to even SEE, due to our present misconceptions, which totally-hide these key features completely, even though they were first glimpsed at the very same time as the Greek Intellectual Revolution, whose Logic currently dominates our Thinking today.

Even Buddha's alternative Holist Logic, which is much closer to Reality in many ways, was developed much too early, to be able to delve to the deep underlying Truths involved, and to an important extent, his approach has also been irreparably damaged - for it did, and, today, still could, be sufficiently re-established, to enable the necessary path to the Real Truth, delivering an Understanding of all Qualitative Change and Development!

But, it would have to switch over to building upon the revealing Holistic Dialectics of Karl Marx. rather than the increasingly misleading Plurality of the Greek Tradition. But, of course, the Stance of the Buddha,





considering all the possibly contributing factors, as against the severe restrictions of Plurality - BUT, both of them never addressed (nor could they ever do so) the link from the “hidden-to-both-approaches” Full Systems Effects, which are not merely a more embracing, but also not-a-usually-causally-linked addition, but, instead, a wholly newly considered aspect, and yet also wholly independent of any underlying Causality, but, nevertheless, contribute at a wholly new Affecting Systems Level of crucial modifications, without which, no further, and so far unconsidered, progress would be possibly correctly addressed.

And that makes these so far unconsidered Systems Effects extremely important and necessary to now pursue!

So, let us finally start with the normal, everywhere-present situation of Multiple Simultaneous Processes, which in the Pluralist Approach are only treated individually - and thereby considering both their necessary resources, and their consequent outputs: BUT only considering any others as either producing the resource or requiring the output.

Such consequent Thinking only deals with the evidently causally-linked members of any causal Chain, BUT also totally ignores all the others NOT directly causally-linked to the underlying process - for they are the most important for sure!

What about the many other processes NOT currently causally-linked, don't they also play some sort of role - constituting with many others a certain enclosing Context, which when they have NO involved role, but can still affect the overall Population, primarily by diluting-and-or-slowng the addressed Process's overall effect.

In addition, that process itself, will from the point of view of the results of its required and produced resources, also be hindered in the very same ways: indeed if the primary process is proliferating due to its regular success, it may well in consequence be decreasing the frequency of that second process - so much so, that it could actually fail to continue with its following process, or even fail to find its feeding process, in order to continue.

Simultaneous processes can reduce the success of others, thus changing-the-mix, AND the final results, as some may totally die out as participants.

This is a characteristic Systems Effect, not even considered usually, but a very significant Effect when it does happen.

But, once the total exclusions of such features has been breached, a whole series of other Systems Effects begin to be considered, and the related series of consequent, often-qualitative effects (NEVER addressed in Plurality) begin to extend Explanations considerably.

These will begin to be addressed in the next installment.

Option E

Systems Effects and Dialectics

Finally, we have arrived at the whole object of this series of papers - embarking upon the first comprehensive attempt, to start to both reveal and describe, the crucial *Systems Approach*, which leaves mere Non-Interpretive Description behind as inadequate, and instead concentrates upon Explanation, at all revealed Levels!

And, this includes not only the well-established Causal Explanations, already effectively tackled, at least partially, for literally millennia, BUT ALSO, and importantly, the Key Qualitative Explanations, which for the first time, deal adequately with all Qualitative Changes, by not just announcing-and-then-describing all their Effects, but finally also Explaining why they happen.

If successful, this undertaking will transform Our Thinking and Reasoning Methods, particularly within the Sciences, as well as in all the other areas, where inappropriate Mathematical Rationality is currently illegitimately, and confusingly employed.

For, the general failure of that Logic to really cope with Contradiction, has, thus far, merely led to an unavoidably increasing number of such unresolved paradoxes and problems, and the consequent limitation to new unrelateable, and hence wholly Separate Areas of Study - the so-called *Specialisms* - each with their own Laws, which have shattered Human Understanding into innumerable sealed-off, and hence causally-isolated sub-systems.

And, it is this major debilitating, yet generally established mistake, that has terminally limited the reach of achievable Explanations - constrained within it, and thereby irreparably damaged all current attempts at

Rational Explanation of Reality. The problem is a major one, and without its removal, the whole system will remain as disconnected and often *unusable* as it is now!

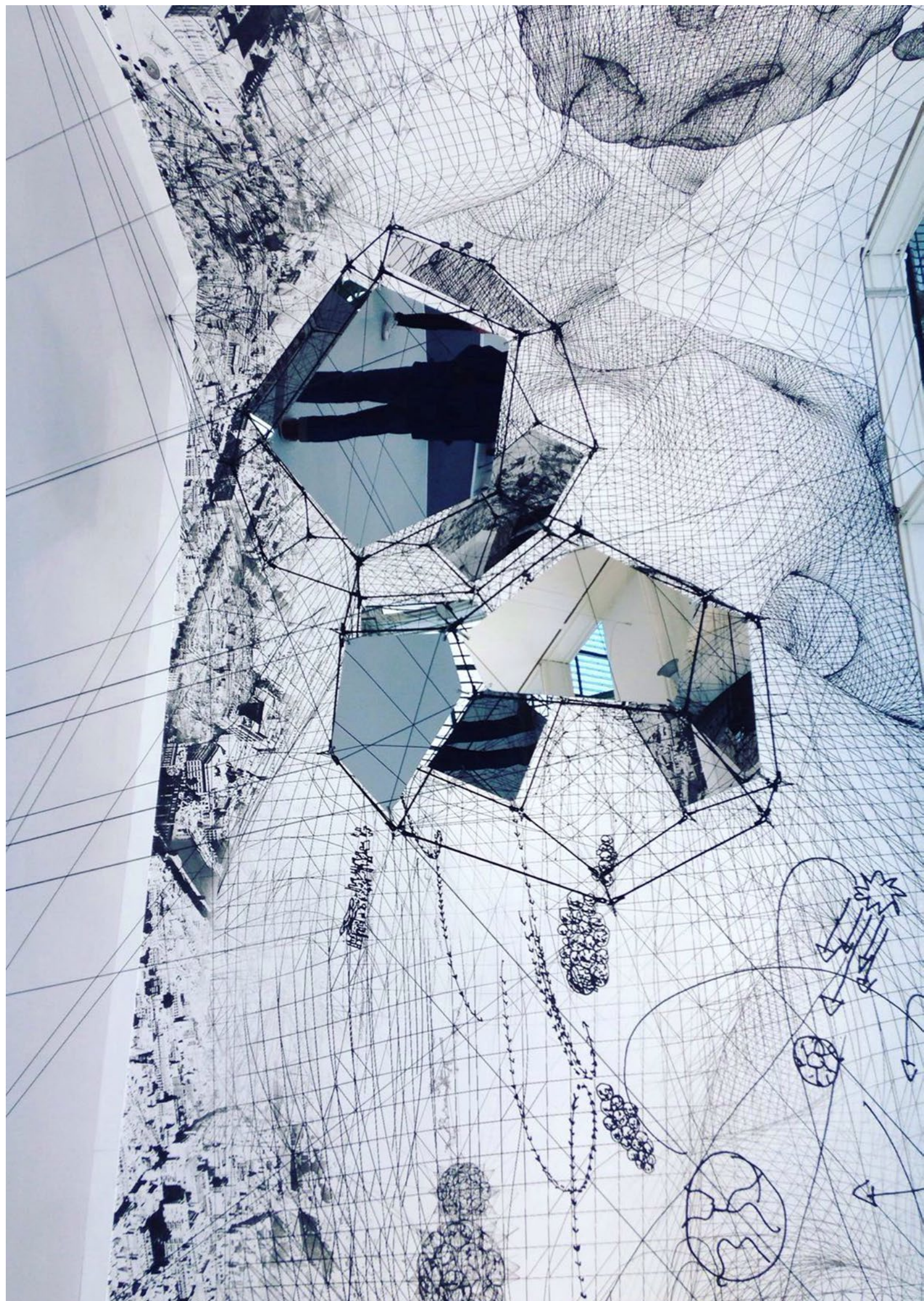
But, we do finally know exactly where to start, because the problems were revealed millennia ago by Zeno of Elea, but only finally tackled effectively by Karl Marx, though he restricted his efforts to what he called Dialectics, but which now has to be greatly extended to include the New Systems Approach too.

So, we can, and indeed will, start, as Marx did, with Diametrical Opposites, though with a much wider, modern *Systems Approach*! For that is where Zeno, then Hegel, and finally Marx, revealed such oppositions as the crucial engines of Change.

When considering the means of dealing with actual Laws, and the mathematical Equations that define them, we can deal with straight-forward Laws, but Opposite Laws deliver something significantly different, for the resultant effects upon a situation will depend upon whether the Diametrically Opposite Law is present too: so to get our required answer we must consider more than the content of a single Law - we have to go to the Systems Approach, and conder whether the two Opposite Laws are present, and in what relative proportions.

For if only one of the Opposites is Present, it will deliver its Effect IN FULL. But, if Both Opposites are present a whole range of Possible Effects come into play - from the relative dominance of one, depending on how much of the other is also present- all the way across the full range to the Opposite's dominance. But, finally including also the totally equal presence of BOTH, for neither to have





any Effect at all: as they will exactly Cancel Each other's Effects out completely.

Now, that is a Wholly Systems Effect, and would NOT be delivered simply by knowing that both laws are present, and knowing what their Effects are: you also have to know "How Much?" as well!

And perhaps surprisingly, when Chains and Even Cycles of processes naturally occur, the Effects can be affected in yet other ways too.

So, as the best possible way of extending things to the fullest range of these Systems Effects, perhaps we should comprehensively deal with Opposites here Fully, as a colourful introduction to the General Topic.

Now, a far more complicated set of Systems Interactions definately comes nto play with Causally-Linked Sequences of Processes, as the Actions depend also upon whether they are initially triggered off by the presence of their initially-required Resources: and, thereafter, continued by its supporting, as Output, the required Resource for the next Link in the Chain. Clearly Chains can be, and are, of almost any length consistent with the available Resources. And each with different overall Systems Effects!

But a Cycle is at the same time more demanding, in that its final Output links back to re-initiate the whole Cycle. And a veritable avalanche of such constantly repeating sets of processes can have radical Effects upon the overall Context!

So Chains of different lengths, though likely to be related, will deliver a whole set of available Products. But Cycles deliver repeatedly the same set of Side Products, but generally are strongly Self-Supporting, incessant repeats, and totally consuming all their own final Products thereby.

So these two will doubtless deliver very different overall Effects!

Now, still by no means complete, the above initial ventures into a basic Systems Approach, have already established a productive beginning via the brief but incomplete excursion into Chains and Cycles. But though highly informative, they deliver only a very small part of that Discipline as a whole.

For, in addition, there are many other important features that have as yet not even been mentioned, let alone considered in detail, and begun to be Understood. And, the most important area is that concerned with what I call Temporary Stabilities, as well as the most important area of all, which is that concerned with the creation of the absolutely New, and impossible to-predict Emergences, that appear at the collapse of prior systems.

Indeed, it is precisely within such topics that the Tempos involved always lasted too long, and defeated our attempts at analysis, as they sometimes took vast amounts of time to deliver their final effects, while in others they were sometimes so fast, as to be beyond the capabilities of Human Beings to even see them as they happened.

So, once again, I will indulge in a brief excursion into the most difficult of all areas, which surprisingly was where Marx found the most profoundly transforming process, radically altering History during Social Revolutions!

For, it was no surprise that Humanity didn't even try to explain what happened within these Transformative Events, because singly, absolutely Nothing was ever predictable, before the Event, either in Part, or in Whole! Indeed, the wholesale subscription to Causality seemed to be terminally undermined by these inexplicable happenings!

But, as it subsequently turned out, literally ALL Qualitative Changes were the result of similar Systems Effects - NOT because Causality was incorrect, but because it was hidden within a Complexity involving multiple contributions obeying the Systems Approach and NEVER only single extractable Causes!

Temporary Stabilities

Marx in addressing Social Revolutions, arrived at legitimate Forms, long before he managed to explain them.

And the occurence of Temporary Stabilities (and especially the very long-lasting versions of these) were recognised but never fully explained, even by him! For those particular versions dominated the long interregnums between transforming Revolutions - and though they were varying all the time: they were NOT produced by a single Causal System, but by a sequence

of changing contributions, which altered the active constituents, but maintained the necessary Balance, by different means!

Explaining that was by no means easy!

The nature of the situations present had to be such that the detailed content of the Systems that delivered such a remarkable performance, in spite of the regular deterioration of some of the prior and actively-balancing components, just had to involve related-supporting-pairs, in which as one went down, the other would go up to compensate: so, thereby, they had to be generally capable of Automatically Maintaining a Balance, playing similar roles as that acting overall.

The overall composition had changed, but changed so that between such Pairs, to maintain that necessary Balance too. What could possibly be present most of the time to maintain that overall Balance? It must also, when things began to fall apart, now act to permanently terminate the Balanced Stability, and thereby also be shown to explain the full performance of the System in all circumstances, including its dissociation and replacement!

And in such a complex situation, you can immediately see why Diametric Opposites would play a key role like absolutely nothing else could! And, no straight-forward Classical Causality could ever deliver such Effects: it would have to be a Complex System of processes, including Opposites, to be able to achieve it!

Now I am aware that the above is NOT an Explanation, but only a Description, of how a complex balanced System can be maintained and finally dissociated. But it is a first step: we know what we will have to explain now!

And, of course we have scarcely begun to address what might be called *Systems Causality*!

Within Revolutions, Crises can move in diametrically opposite directions within what initially seem to be consistent conditions, for within the final dissolution of the old long-lasting state, the failed Crises nevertheless get ever-bigger until all key features are dissociated, in what I call, in Emergence Theory, The Nadir of Dissociation.

Yet remarkably, a series of new creative “Crises” emerge from the collapsed System, that successively build inexorably towards a wholly New Stability - yet absolutely nothing new has been added! What was now building a wholly new and unpredictable Stability, must have been hiding there all along. It was the total elimination of ALL the components maintaining the old Stability, that now enabled a wholly New set to dominate, erecting their own very different Stability from the pieces that were left.

A new System has been born!

Slowly but surely, the determining Heart of Reality is being exposed, which has as its motive force *Contradiction...*





Option F

Now, in spite of the total lack of attention paid to Systems Effects, over the whole history of scientific endeavour, they are not just some minor element of Reality-as-is, that we can continue to ignore. On the contrary, these Effects are always-and-everywhere present, but are often not visible to us at first - not only due to the universally-applied Pluralist Approach, which systematically removes them from our experiments and equations - but also because their own natural Systems Features make them very hard-to-discern, both because of the Temposinvolved, but also their own complex multi-factor causalities.

For, the universally adopted Pluralist Approach actually changes both the Nature of the studied events, significantly, as well as their evidently Different Tempos, relative to others, including actually Selectively Totally Eliminating some Tempos completely, bringing absolutely everything into a simplified and easy-to-study uniform activity, and thereby hiding some of the subtle complexities involved, very effectively indeed! They are still there in the background noise, but they are undetectable for now, seducing us with an imposed simplicity!

Let us, once again, compare directly the Natural Holist World, in all its complexity, with the artificially-and-rigidly maintained scenarios of Plurality. The Real World is unavoidably multifarious, in two different ways, BOTH of which are lost with Pluralist simplifications.

The first and most obvious ones, are the many simultaneously acting factors identified in Holistic Systems.

But the second set of eliminated factors, are only present within the many diverse Levels of Reality: so if you are no longer looking at the Level where they reside, you might consider that they no longer exist!

There are multiply-affecting factors acting both at the most obvious Single Level under scrutiny, as well as those, not usually evident, at a diversity of different Levels of Reality, from the Sub-Atomic to the Cosmic!

Plurality ignores Levels and their possible interactions.

So, with level-upon-level of many multi-factor causalities occurring, they are sometimes very well hidden by their differing Tempos and Scales, but most often they are temporarily suppressed, wholly artificially, to deliver a much simpler and ideally Single-Factor situation - an isolated Pluralistic Law that we can use.

It was inevitable, because the New Way was ideal *technologically*, for the desired Production of most things: and so for wholly pragmatic reasons, Pluralist methods very quickly became the norm, for Technology far outstripped Science historically - because it was useful to us in our everyday activities! Theory always lagged well behind successful Practice.

But sadly, the Greek Intellectual Revolution, generated two potentially opposite approaches simultaneously within a single Revelation. The intellectual assault upon Mathematics had delivered the very first System-of-Rationality, which allowed mathematical problems to be addressed, and even solved, solely by Thinking! Mankind had been introduced to Rationality - BUT it was valid in Mathematics alone.

Yet with *Number* being applicable in many other Disciplines, that same purely Mathematical Rationality was wholly illegitimately smuggled into them too! But Reality-as-is generally is NOT Pluralistic in nature - and so General Reasoning and all the Sciences should be Holistic

And as this is NOT agreed-with by most Thinkers, we must clearly define what that means, and how it differs fundamentally from the status quo.

Reality-as-is, is multifareous - many very different things, at a multitude of different Levels, are simultaneously both affecting-and-changing each other. The restrictions of Plurality deal with this vast complexity by removing it wherever possible. So applying Pluralist Mathematical Rationality in Reality-as-is, is wholly illegitimate and can only deliver false answers!

I'm sure both Technologists and Scientists would be "up-in-arms" at such an assertion! And in doing so the Technologists would actually be correct, but the Scientists are wholly WRONG! For the Technologists did know they have to work in simplified Pluralistic environments for their methods and equations to work. Technologists don't discover worlds, they *build* them. And a key part of this construction process is removing what is seen as unwanted from a Human-controlled space.

Science increasingly relies on Technology for everything it does. It has become the study of these Human-controlled spaces.

Real scientists must do everything they can in *natural* Holistic environments, for their derived Theory to be legitimate. For so-called "Theory", cereably derived from the usual Pluristically restricted contexts, will be wholly misleading, and unavoidably incorrect, when used in that way.

To establish any Real Theory within any Science, will require its extraction from genuinely Holistic Contexts: and, to achieve that, the experimenters involved, would have to both realise the simultaneous multi-factor Nature of Reality-as-is, but consequently not only by successfully-achieving such real Contexts, but also and essentially by fully understanding the complex imposition of all the involved factors, both at the Main Experimental Local Context, BUT ALSO along with all others contributing to all the Levels occurring-below and

thereby also contributing-to producing it! Of Course, that is indeed a very tall order, but to choose a natural starting context, upon which to build a limited but still legitimate Set Up, which is often achievable. And when it isn't, discovering an artificial version of it should still be possible to deliver and use.

But, of course, all that would require a full and detailed Knowledge of all-those-conditions, and their underlying contributions, which they would all make to the final Reality-Produced Results. And to an extent, as the Tempos and contributions will vary significantly, in spite of the majority of cases being fairly easy to find and use, there will always be others, most of the time being ignorable, but of which we should still be aware, so we can include them when it does significantly matter.

Let me re-iterate: to derive any real Laws from experiment, all of the above would have to be involved.

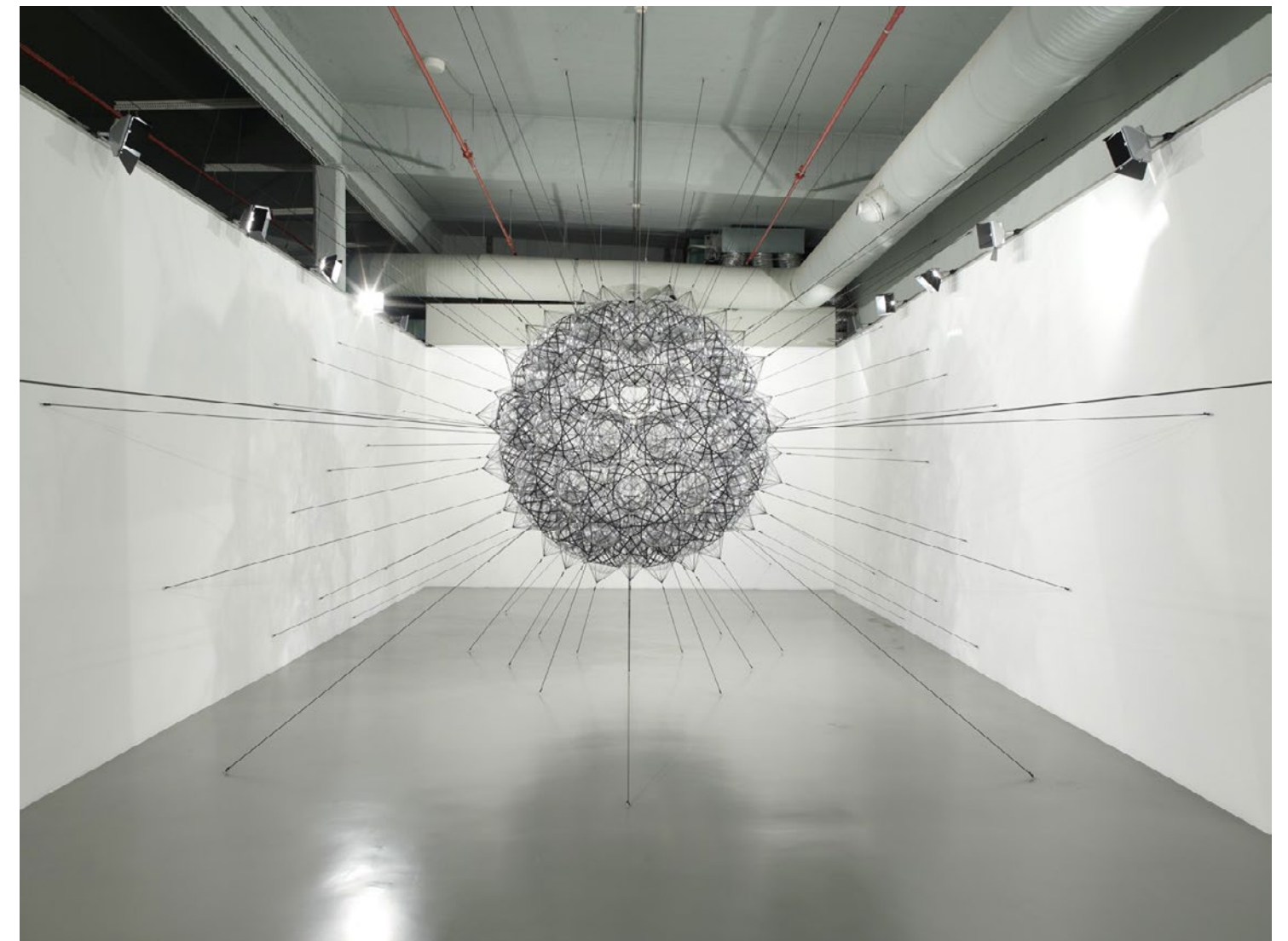
For without this Holist Context, any resulting Real Law would NOT be involved: instead what we would arrive at would ONLY BE a strictly Pluralist Law, and NOT a "Law of Nature" at all, but one of a cut-down, highly-constrained version, that would ONLY happen in those precise and strictly-maintained circumstances.

The whole correct method of predicting a Real Outcome will not have been involved! We must NEVER extend pragmatic solutions to the status of Understanding, because it is never, and can never be, that. Nor can we extend our Understanding via such Laws: that definately require Real Relations along with New Knowledge!

For what is revealed, if these are not achieved, is never the Truth, but a situation regularly achievable, in a given Limited Context, which can NEVER be extended into a General Law. They are, at best, only Local Regularities, and NOT contributions towards Real Truth!

It delivers the "Pragmatic Truth" of Doers.
Not the sought-for "Real Truth" of Thinkers!

The "Real Truth" must now be our goal.



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