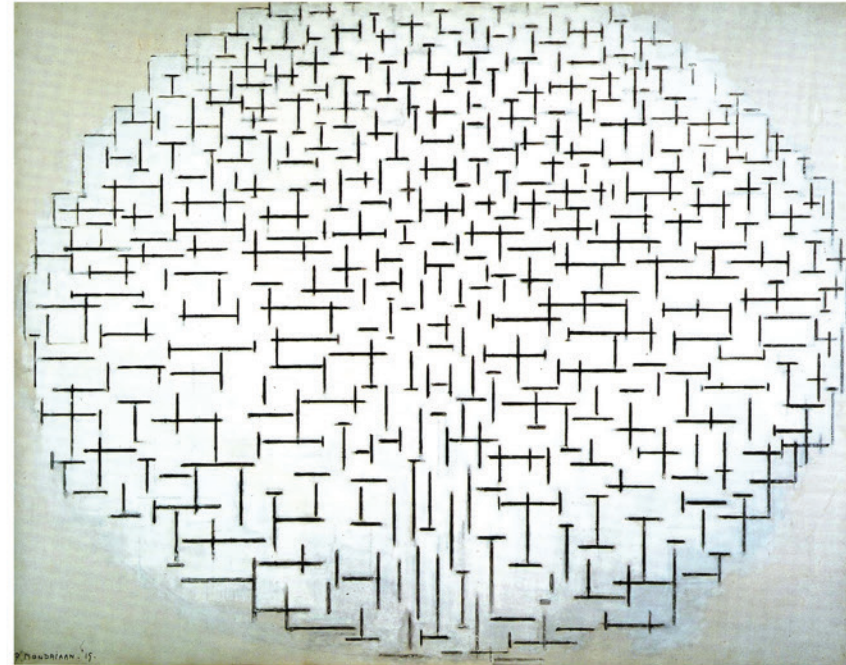
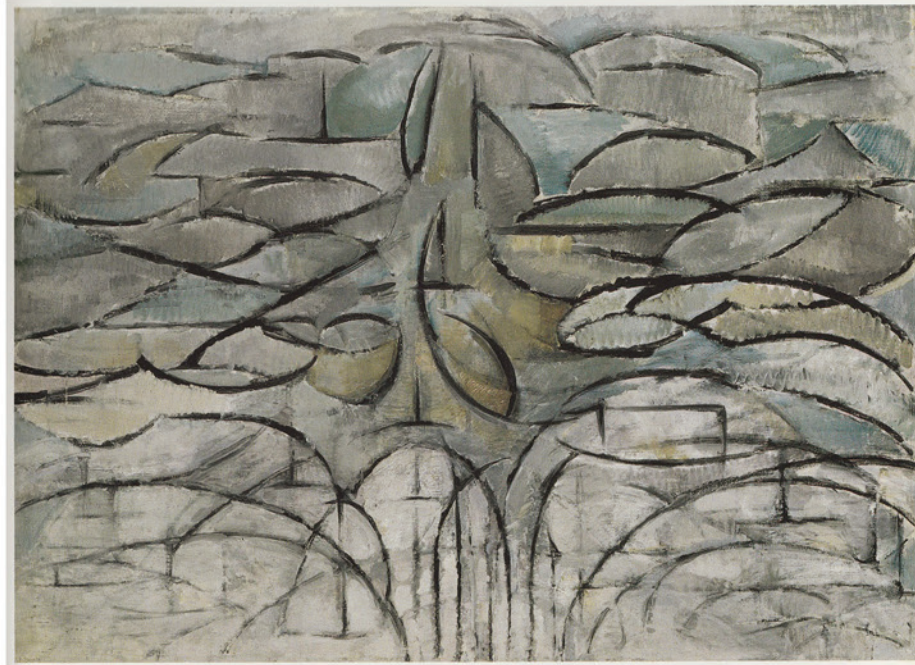
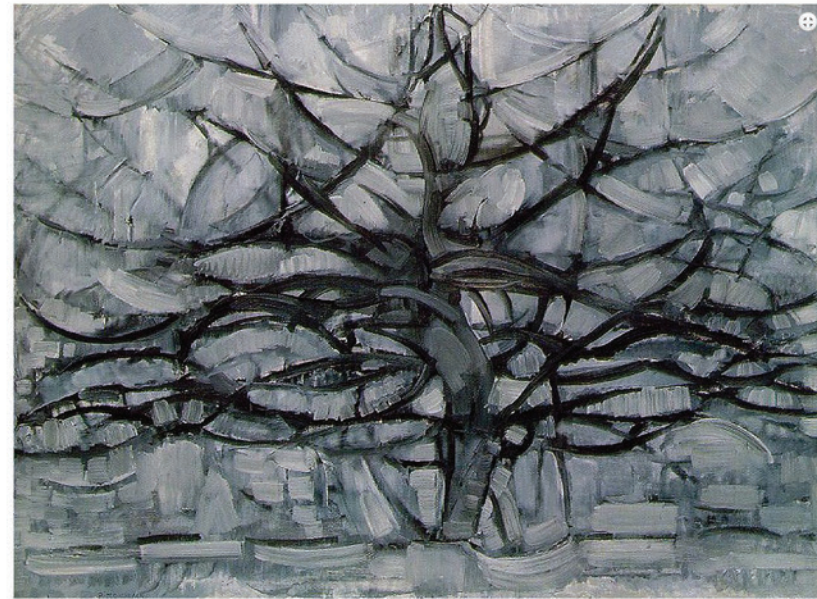


SHAPE JOURNAL

ABSTRACTION

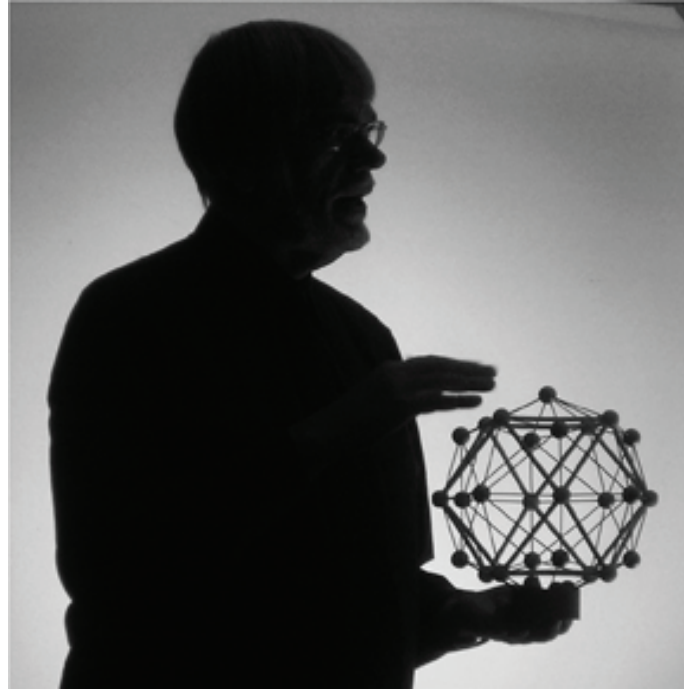
A BRIEF HISTORY OF ABSTRACTION / THE NATURE OF ABSTRACTION / DIALECTICS
THE MYTH OF EQUATION-BASED THEORIES / ABSTRACTED FORMS / ABSTRACTIONS & EMERGENCE



Special Issue 30 **Abstraction**

1. Introduction
2. A Brief History of Abstraction
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4. The Myth of Equation-based Theories
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Introduction: Abstraction



Welcome to the 30th Special Issue of the **SHAPE Journal**.

Although the following series of papers addresses the question, “What actually is Abstraction?”, in various ways, we must start by being absolutely clear what Man is always attempting to do with the processes of abstraction that he generally uses. For, he is, quite definitely, transforming what he can somehow extract from concrete Reality into purely, cerebral forms, suitable for “thinking about”. Reality-as-is is far too complex, inter-related and evolving to be grasped formally exactly as it appears. Also, Mankind is NOT naturally equipped to handle such complex things. In spite of this, Homo Sapiens is still well-named. His intelligence was a product of the brain’s evolution, due to its relation to more prosaic and everyday problems of survival. But, he then attempted to apply it to much more general problems.

Classically, throughout his evolutionary development, Mankind did not arrive at the sort of means he required to tackle why things came to be the way that they were. Indeed, to get anywhere at all, he had to effectively “pull himself up by his own bootlaces”, and indeed, somehow, “Make Himself”, in gradually beginning to equip himself to make some sort of sense of his World, via struggling to answer the remarkable question, “Why?”!

Naturally selected-for, as he was, as a hunter/gatherer, there was no mental implements available to tackle such questions, so it, unavoidably, turned into “How?” instead, and even in doing this, he had to both simplify and idealise what he observed, and such a general set of processes is termed Abstraction.

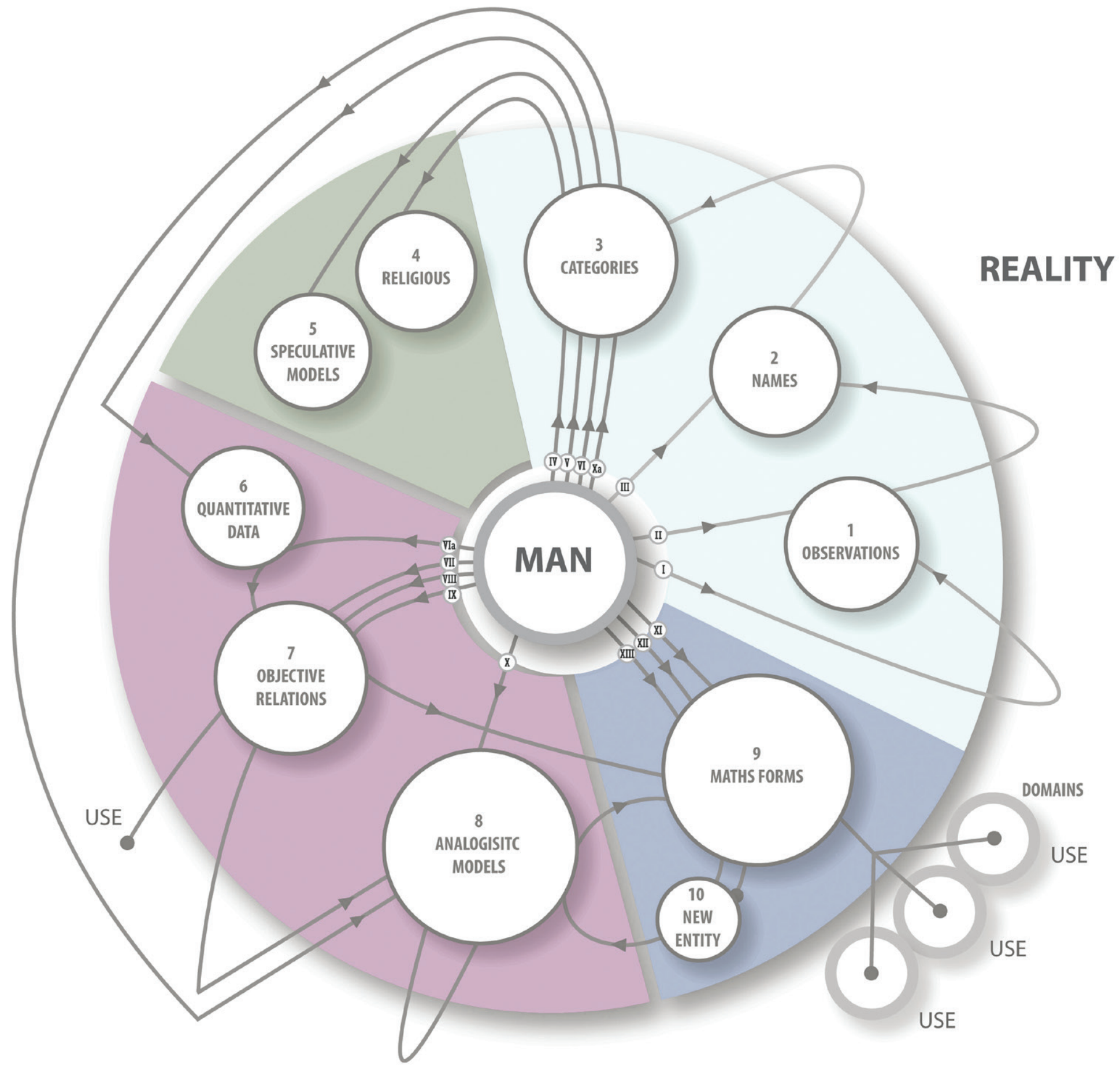
What were extracted from concrete evidence were not the required “reasons”, but instead the Forms suitable to be then thought about – conceptions, idealisations and even all-embracing principles, which he as a hunter/gatherer could think about and attempt to apply, as he did with his hunting.

He began to construct an entirely novel means of doing this via Language, and much later, writing, but the crucial developments were in how he abstracted from Reality, and thereafter, begin to think about such forms. Clearly, initially, all he could do was to attempt to fit the ideas he employed in his daily life to such questions, so all his determinators were like himself – a thinking Man. But, also clearly, the one-to-one correspondence with concrete Reality was impossible. Reality-as-is and the conceptions that Man managed to create were not the same things at all, and never could be. Man managed to reveal and extract ever more crucial aspects, views or components, which were turned into elements-of-thinking, and with his well-developed mechanisms of sense, thought and subsequent action, that had been made so by selection as a hunter/gatherer, he managed to use actions, based upon his concepts, to confirm or deny them to an increasing extent. But, they were always cerebral reflections of real things, so that the Absolute Truth of concrete Reality was never possible to be achieved. Let us therefore see what he heroically did achieve, and crucially where and why he failed!

Jim Schofield Jan 2015



- BASIC
- MYTH
- SCIENCE
- IDEALITY



A Brief History of Abstraction

Or how idealisations both help & hinder

Some years ago this researcher wrote a paper, with a detailed descriptive diagram on *The Processes and Productions of Abstraction*. In effect I was doing-a-Hegel – for he took, as his area of study, Thinking about Thought, whereas I was Making Abstractions about Abstraction!

It turned out to be an important contribution, because it identified a special category of Abstractions, which produced results that were not exactly the same as we look for in concrete Reality, but via Human Thinking that were both formal and idealised. It was clear that they were significantly different to what Science usually seeks and sometimes finds in concrete Reality.

This new category was labelled as *Ideality (The World of Pure Form)*, and was clearly very different from what productions were usually sought in relations in the physical investigations of Reality. But, perhaps surprisingly, this special area was not only LESS than the full set of possible abstractions from Reality in the restrictions to what situations were dealt with, and in its elimination of all non-formal things, but also MORE than Reality in its possible and seemingly legitimate extensions to its “Maths Forms”.

It is certainly worth a brief study of the diagram shown above to sort out the processes and productions being discussed here. Notice the differences between Ideality and all the other categories revealed.

Now, though we do not always admit to it, such things have always been there in Science (and, of course, in all other Human Thinking), and, it turns out, they have also been absolutely essential there. But, they have increased in supposed importance, so that this category is now considered to supply “The Reasons” for Reality being as it is. Such an inversion is clearly wrong!

A Category of Abstraction cannot reveal the causes of concrete Reality itself – for such a standpoint would be the opposite of scientific: it would, indeed, be wholly idealistic, top-down view. But, if we stop there, just identifying its existence, and denouncing its supposed primacy, we will certainly have done not nearly enough to reveal its now well-established new role. For, our only means of dealing with Reality has to be by the means we intrinsically possess, or have managed to develop, in our thinking – we cannot avoid such processes, for they have always been our greatest strengths and primary tools.

For, Ideality does indeed enable Mankind to affect Reality in many very important ways, though the users do not necessarily understand why. So, that important diagram (shown above), was clearly only the first step in understanding this remarkable creation of the minds of thinking human beings – for that is certainly what it is! Yet, in spite of its drawbacks, it has definitely enabled the whole of the modern, technological World.

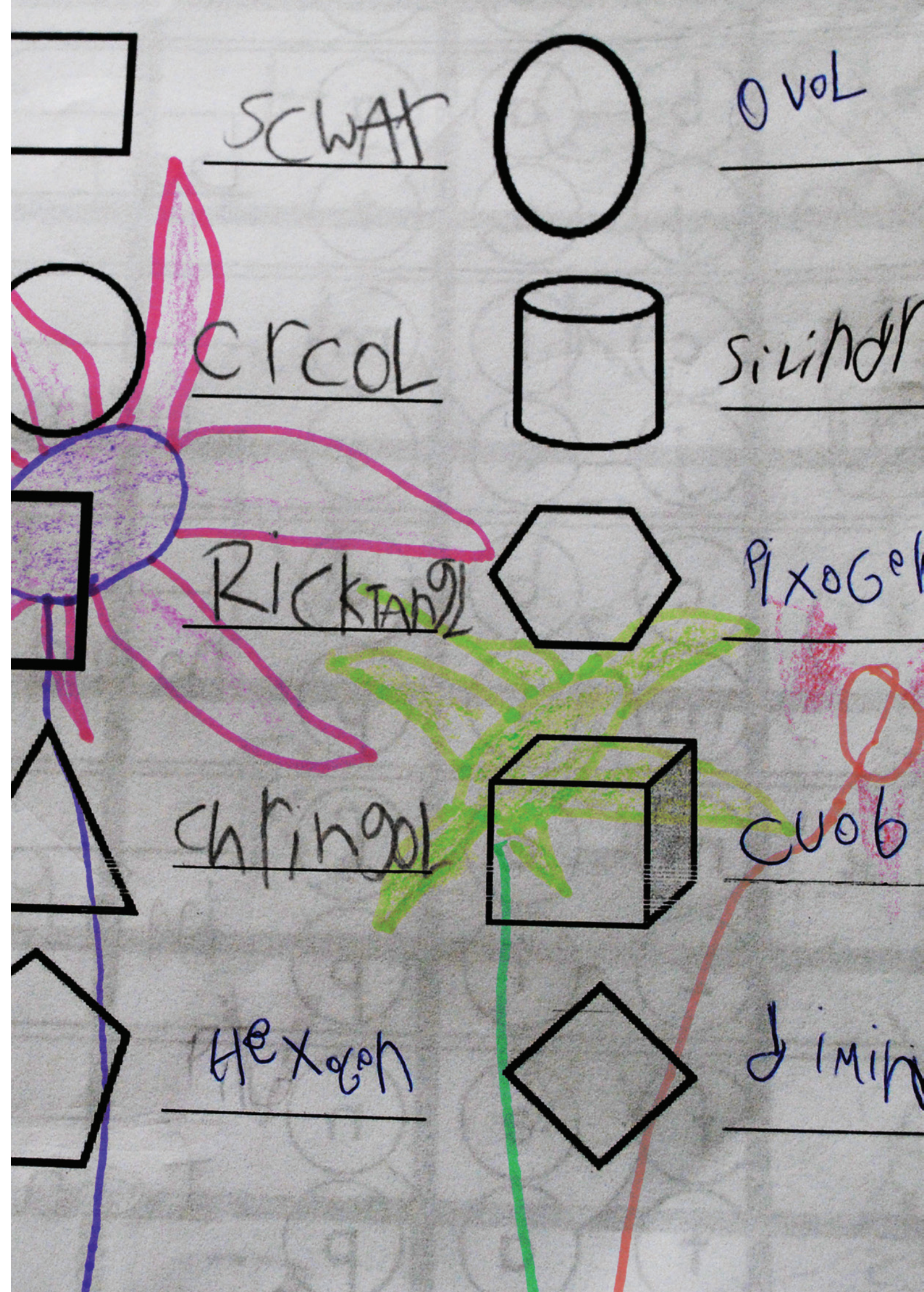
So, let us see why, while at the same time as delivering a great deal, it can also go badly wrong. And, thereafter, address how its misleading derivations can be both effectively tackled, and even remedied.

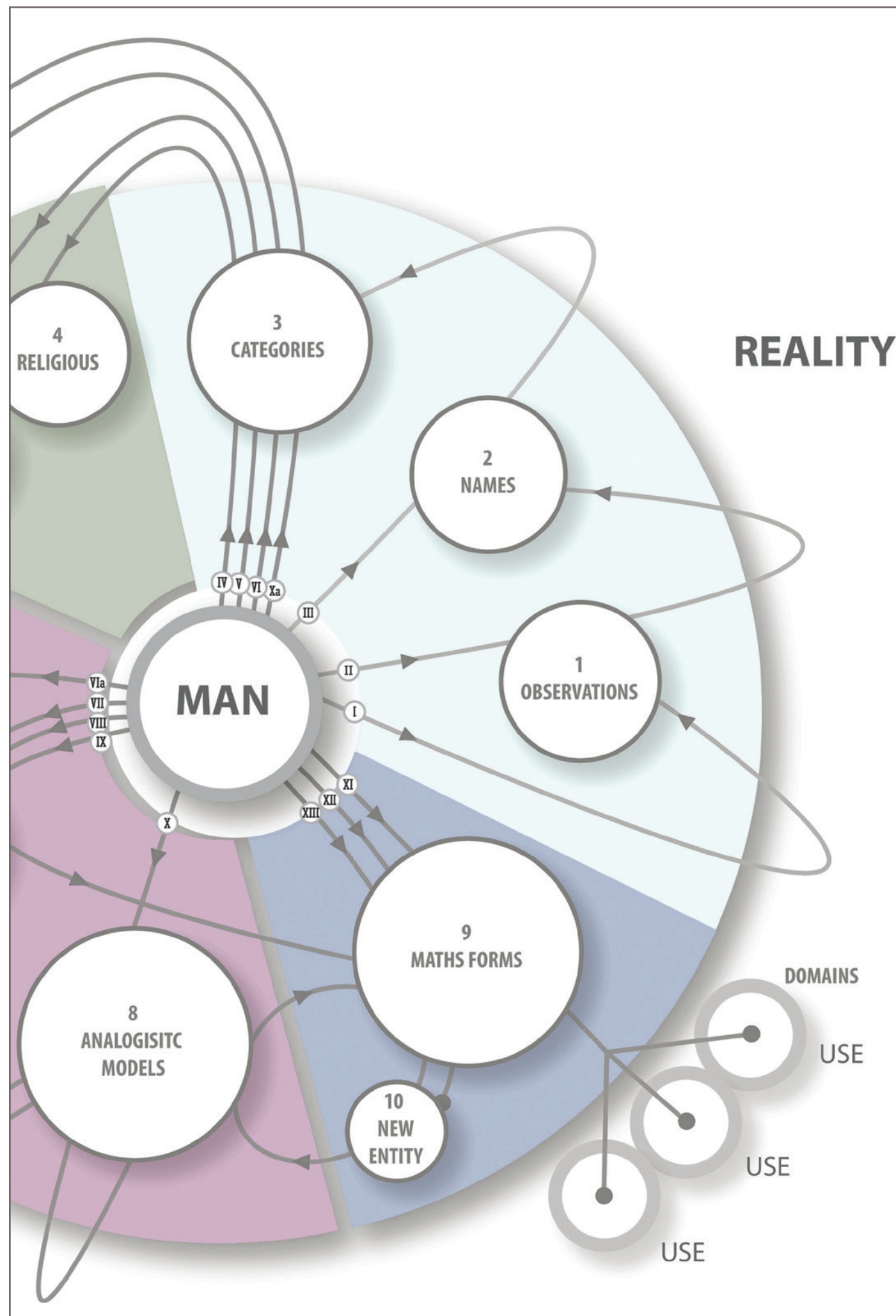
As is immediately evident, it will not be an easy task. For, in essence, it cannot be other than contradictory. It will allow certain things to be achieved brilliantly, while also inevitably putting a seemingly impenetrable cap upon necessary developments! For, it really involves not The Truth, but only so-called Objective Content, and that will always run out of applicability, and regularly deliver totally contradictory derivations, if not regularly and radically revised. So, though it always enables Technology, it actually *impedes* Science, and we must see why!

It is because, what we are dealing with is a product of the Thinking of Man, so that we must first start by realising what Man really is, and what made him that way.

What he certainly is not, is a GOD standing above and beyond Reality, and seeing everything objectively, exactly as it really is! He is, on the contrary an animal, selected for by the processes of evolution to survive due to his abilities, his adaptability. These abilities did not evolve for *understanding* Reality. On the contrary, the spectrum of pressures that he endured were much more pedestrian and pragmatic than that. But, in what he actually became, due to those selective forces, he actually became the possessor of a remarkable brain, and he often attempted to use it in many very different ways to what it had been selected for. He began to think about why things were the way that they were. And, in addressing such things, he actually created *Philosophy* – not a practical ability and undertaking!

It most certainly was revolutionary. Nothing in Man’s initial way of life – so-called hunter/gathering, demanded answers to such questions, but Mankind had developed social relationships, with other members of its species, which involved acting together in a cooperative way, and hence to entirely advantageous features such as complex language allowing the communication of ideas.





Man had changed the game, and his new abilities also could also be selected for by increasing success in the struggle to reproduce and grow in numbers. And, some of the things that Mankind could do with these unique qualities were, indeed, wholly new. Man began to make himself!

But, in truth, he was at once both brilliantly and yet inadequately equipped for what he now attempted to do. He had no basis for asking the questions that he did. But, both his successes and his failures demanded answers, and he began to extract wholly new things from his experiences. He began to name certain processes, and what factors seemed to be involved.

He had begun to abstract!

But, as the diagram shows, these were the primitives of Thought and Abstraction. Via Observation, Naming and even Categorisation, he generated as many questions as he solved. The question “Why?” began to become important.

And, the early answers that he arrived at were remarkable. He clearly realised that Mankind was a unique case, and among his breed there were always particularly exceptional individuals, who could be relied upon to deal effectively with threatening predators, or arrive at the best possible decisions, and from such earthly leaders, Mankind began to imagine supernatural Gods, in his own earthly image, but taken to a remarkable level. These Gods were also in charge of all crucial areas, and hence capable of anything.

Remarkably, when a human group collectively subscribed to such beliefs, and acted in concert due to them, to “influence” their Gods, and, acting together, both in such efforts and in mutual defence, they proved to be significantly more effective and successful than those who did not have such an empowering basis.

Now, this type of Abstraction was truly remarkable. For there wasn’t any such God, but the embodiment of the very best of Mankind, in a Maker, was indeed beneficial. Abstract conceptions were embodied in the belief in supernatural male and female Gods, who could be on their side, and give strength and wisdom to what they did.

Mankind had begun to abstract, but needed a “real” receptacle for his abstractions.

In the diagram this clearly played an important role. Its significance was not that it invented non-existent Gods, but that they had actually deified many abstracted gains from their experiences, and began to attempt to live by them.

The next, revolutionary step beyond that situation was made possible by what is termed the Neolithic Revolution – which was initially in particular places like Göbekli Tepe (in what is now Turkey), where wild grasses with uniquely large seeds, which remained on the stems right through

ripening (an unusual evolutionary development) finally persuaded people to gather and plant these seeds to ensure a substantial crop, and Farming was born. And this, along with the domestication of certain wild animals, together transformed the lives of the people involved. For they could not only survive, but also flourish, and for the first time settle in one place, as distinct from their necessary wandering lifestyle as hunter/gatherers.

And, this empowerment began to change the activities and consciousness of the groups involved – for they had more time to pursue many more activities of all kinds, and their collection of new abstractions pushed their God Images further and further away from the old limitations imposed by a life on the very edge, and blossomed into a major Super Being as a Single, all-powerful God, and Thought, itself, was recognised and termed Philosophy.

Yet, these abstractions were never actually true conceptions of Reality, and no completely dependable system of extracting such was yet in Man’s hands.

And, in these conducive conditions two such methods arose. The first, basically philosophical, attempted to relate abstractions to one another, to establish more general “Truths”. The prototype had been seen in purely formal extractions (termed Mathematics), and the same sort of system was gradually put together, about ideas and conceptions, which became Formal Logic.

It was, of course, yet another revolution, and led to remarkable developments occurring primarily among the ancient Greeks in their flourishing City States. But, let us be clear – even this victory wasn’t without problems.

Mankind was still attempting to use his unusual abilities in wholly new ways. He had to pull himself up by his own bootlaces, and that meant that no gains were ever unconditionally true. They were always mental constructions, actually bending methods selected for quite different purposes, to now being used in ways quite unconnected with such things.

What Mankind managed to do was put together ideas that contained something of Reality, but usually couched in old forms, that had served him well in prior and desperate times. Even at the brilliant dawn of Philosophy in Greece, Zeno of Elea showed with his Paradoxes, that the arising thinking methods could lead you into contradictory dead ends.

The trouble was that Abstraction was a kind of a “two way implement” – it both revealed something valuable, but did it by both simplifying and idealising Reality to represent it via Perfect Forms alone! And, the model for such simplifications had been evident from the beginnings of Abstraction - to extract anything Reality had to be held still!

It is made clear in the basic Identity Relation of Formal Logic – namely $A = A$. Man effectively simplified Reality by immobilising its natural changes. Things were treated as constant!

They weren't constant, of course, but to treat them so was a good first step, for it actually seemed that way - most of the time. So, it became part of Man's method to purposely keep things as unchanging as possible, while attempting to understand them. Clearly, Man's invention of Farming was compared to Nature and provided what had been a very effective model, and was extended to studying all things. Reality was, as far as possible, kept still in its most advantageous state.

Once this was done, further developments became possible. But, that basic principle of Constancy, had to be, not only maintained, but also turned into a kind of Principle for revealing underlying "Truths of Reality"! This basic Principle was (much later) called Plurality, and it made each and every phenomenon a SUM of underlying and constant factors, and this would be true, level below level, all the way down to some final fundamental causes at base. Thus Analysis was clearly possible.

With the "keeping-still" imperative, this meant that the abstractions ultimately could be reduced to eternal Laws of Nature. And this Principle of Plurality opened the door to a new era, which later became known as Science (as shown in the Diagram).

Now, at this point, it must be emphasized that the real Study of Abstraction, by this researcher, was only just beginning. The diagram shown was still not complete, and a few more steps were necessary, to deliver what is presented here. But, much still had to be done.

Indeed, at the time of creating that image, the role of Plurality was not yet clear, and, indeed, it doesn't even get mentioned in the various accompanying narratives produced.

The next developments, with an implied, but not admitted, predication upon Plurality led to a significant bifurcation in the Processes of Abstraction, which seemed both natural and legitimate at the time. It occurred when Reality-as-supreme-arbiter was omitted (as the diagram clearly shows) in Processes that went directly between abstractions without any intervening recourse to Reality. Thus, such processes actually created a new category termed Ideality – which, because of this, moved things into the realm of Pure Form alone!

There was still, indeed, a relationship with Reality, but it had changed significantly. For the inference had become that the abstract Natural Laws were the motive forces of Reality, rather than the Productions of Reality. And the constraints, that had made their extraction possible, were

now re-interpreted as the means of exposing these primary causes – the Laws themselves! The crucial and necessary relationship was thus inverted, and the "simplicity" and "elegance" of these purely formal relationships were gradually seen as what was important, and indeed the Main Purpose of scientific investigations. The relationships with Reality were demoted to being clearly secondary.

On the one hand Reality could "confirm" the "Truth of Natural Laws", and on the other, it also enabled their USE – for by replicating exactly the conditions under which they had been both revealed and extracted, they could be reliably employed in predictions and productions. This wholly new paradigm, though based upon prior Science, was being transformed into Technology - as the Use of extracted Natural Laws!

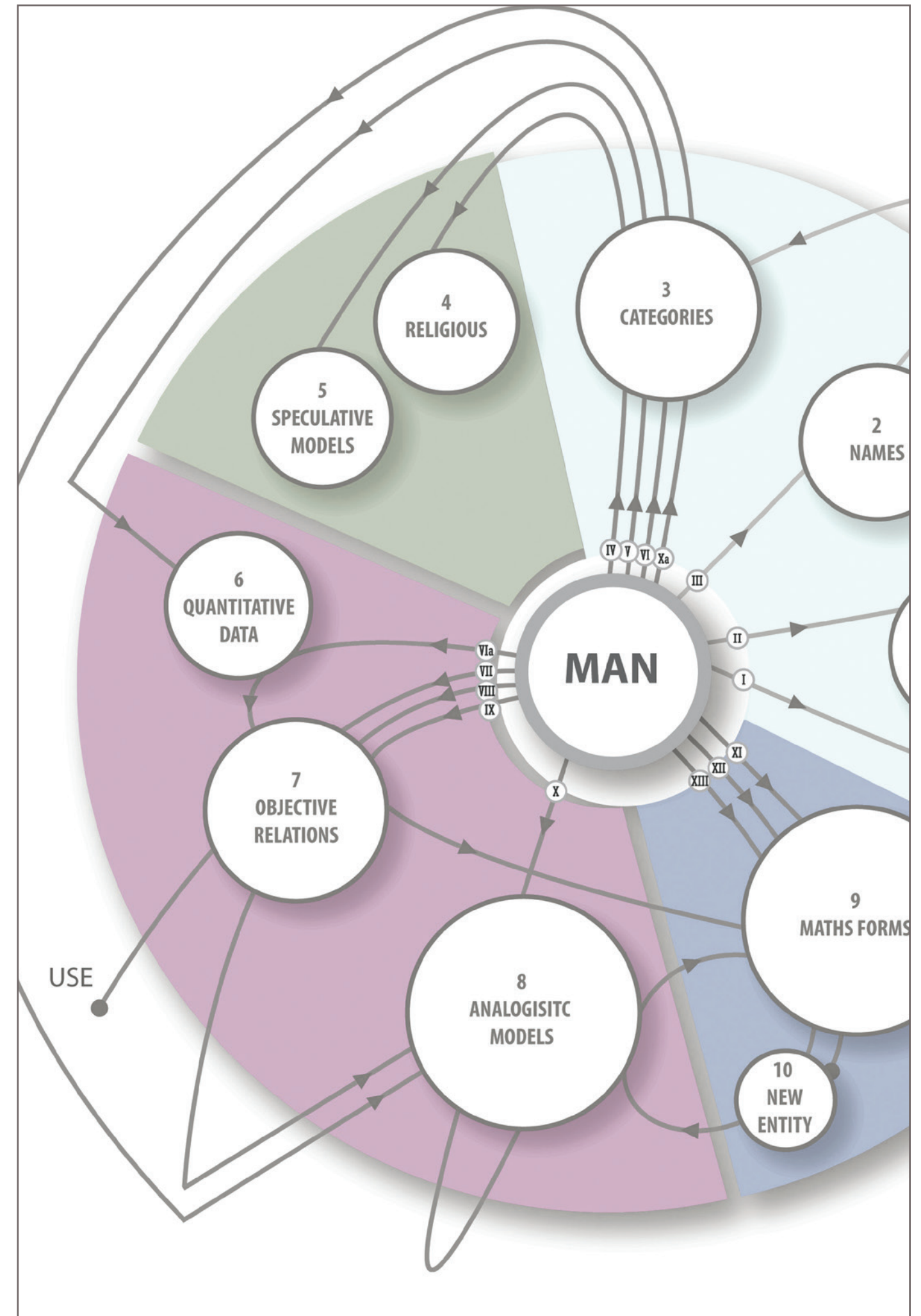
The mechanism for this, and the main problem in maintaining a continuous progress in understanding, was basically due to how Mankind had first organised the abstraction from Reality, and, thereafter, thought about these gains!

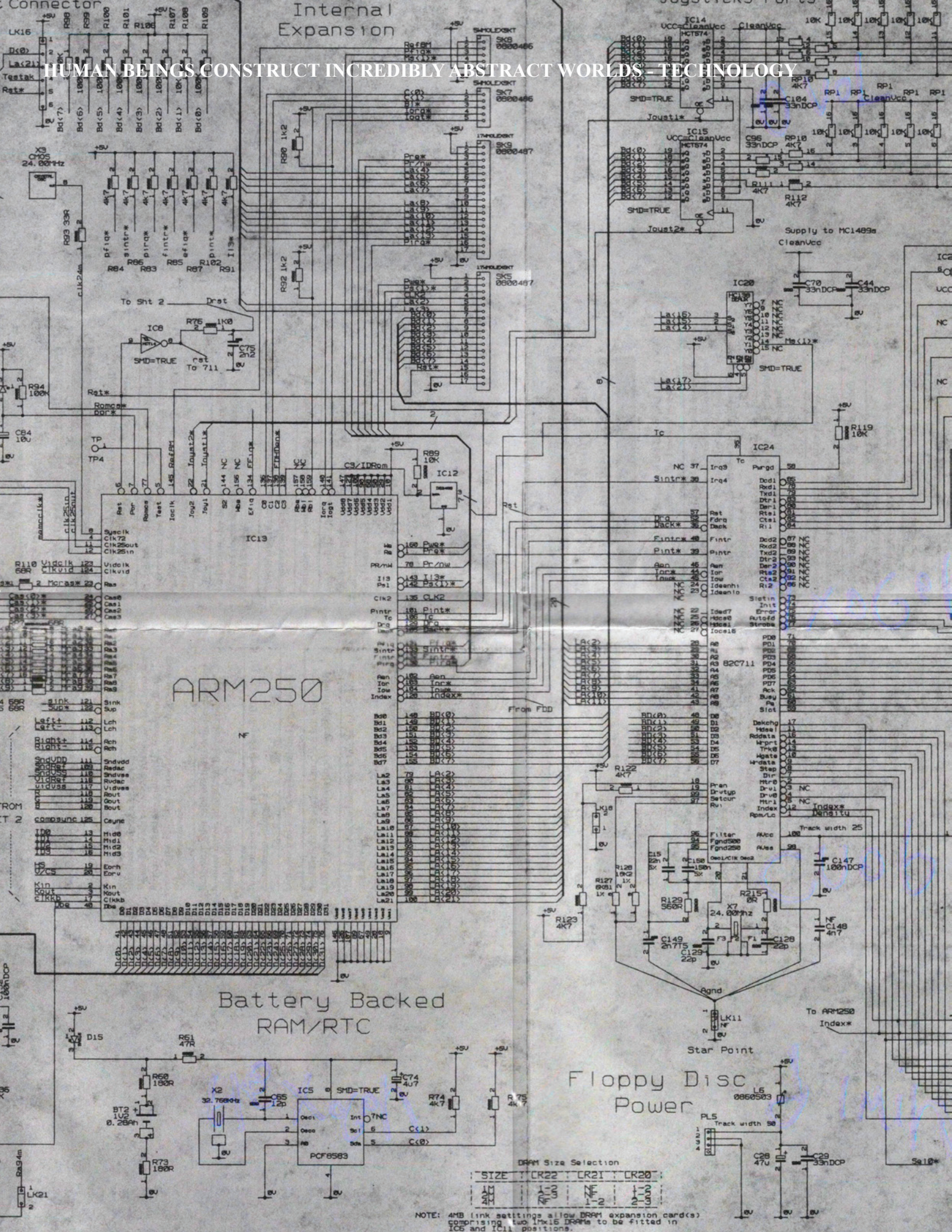
For such processing never actually dealt with Reality-as-is, but with the most simplified and idealised abstractions that he could achieve at each given stage in HIS general development! The processes involved, and particularly the assumptions and principles inferred were imperfect, and could never smoothly and continuously deliver an ongoing development. The trajectory would always lead inexorably, at every stage, to a seemingly unsolvable impasse!

The basic problem was the Principle of Plurality. The trouble was that it just isn't true, and yet it is the basis upon which all our methods are based. And the reason for our unshakable confidence in it was that, in ideal circumstances, usually artificially maintained, the pluralist conceptions approximate very closely to what occurred there. But, these constraints were misinterpreted as actually revealing underlying relations, whereas they were actually producing them via a constructed and idealised Stability, wherein Plurality was close to being true! Not the same thing at all, is it?

For, when the necessary conditions for this imposed Stability were not maintained, the "revealed" laws simply no longer held! Of course, such a wonderful discovery as this was not to be given up (and quite right too for it did definitely enable the successful prediction of outcomes and hence intended productions, within that Stability!) The supporting explanation for this use, was that in unfettered Reality many other, confusing additional and simultaneous laws were "muddying the waters", and the methods that were used were removing these to finally allow access to the sought-for Natural Laws.

Now, such methods are indeed invaluable for making use of the relations that they revealed, but that wasn't





HUMAN BEINGS CONSTRUCT INCREDIBLY ABSTRACT WORLDS. TECHNOLOGY

the problem! What were significantly mistaken were the conclusions drawn from these techniques and their conforming Principle of Plurality.

- For they led to the following conclusions:-
1. The found laws were eternal Natural Laws
 2. The mere Summation of such laws was sufficient to deliver Everything in Reality-as-is

BOTH, of these effectively embodied in the Principle of Plurality were mistaken!

Yet, it would be pointless to criticize Man for these mistakes, for without these methods and ideas in his explorations of Reality, he would have, at that stage in his own development, got nowhere. He would have remained at the prior level that had lasted about 190,000 years since he emerged as a new species Homo sapiens. In spite of its errors, it was indeed a major revolution! Yet, it did, certainly, put a "cap" on the development of his understanding of the World. He had opened the door to Technology, and that was brilliant. But, the door to understanding had not yet been found. Millennia of false theories would also be the legacy of this "breakthrough".

So, to develop beyond these restrictions, the bases of Man's investigations of Reality, would, at some stage, have to be radically transformed. Yet, long before this became possible, we must log the many other impasses that were the inevitable consequences of this Pluralist Method, and also delve deeply into the limitations of Man's current methods of Thought.

Even at the very dawn of these developments – in Ancient Greece, there were dissenters. The most important was Zeno of Elea, who considered two particular conceptions in movement, namely Continuity and Discreteness, and revealed that they were totally contradictory and incompatible, and would inevitably lead to confusion, as he demonstrated in his famous Paradoxes – particularly Achilles and the Tortoise and The Arrow, which were a devastating critique of the methods that were considered indisputable by the majority of his contemporaries.

NOTE: Yet, at the very same time, in India, the Buddha had taken the exact opposite stance of Holism. Even then, the accepted methods of Reasoning were not always adequate, but in many situations were sufficient, so they continued to dominate. Up to this juncture, the constant references back to Reality allowed the "abstractions" to be kept-in-check (as the diagram shows). And indeed, crucial discoveries, at the later stages, often led to revisions in the earlier stages, and so improved the system overall (and these are clearly evident in our diagram).

There were always those who considered that such abstractions were the driving essences of Reality, but the continuing insistence upon Reality as the supreme and

final arbiter stopped these people from dominating. But, the continued dependence upon the Principle of Plurality proved to lead to the demise of the old facing-both-ways attitudes among scientists, when presented with clearly contradictory conceptions.

The definition of the Quantum totally undermined studies in the sub atomic area, and, indeed, certain abstractions - such as the "Particle" and the "Wave" were proved to be inadequate.

While, at the same time, the Mathematics that was increasingly involved, could be tailored-to-fit absolutely all cases (one way or another), and the old hegemony of Reality was OVER!

Hereafter, the real "Truths" were now considered to be the Abstractions, and Reality became merely a confirmer-of-the-correctness of Equations. The mightiest Crisis in Science had arrived and was being diverted-around-it by ever more unreal mathematical forms.

After a glorious history, our Abstractions were now mistakenly taken as the reasons for absolutely everything.

But, of course, that just isn't true. For, to transcend the major impasses, regularly revealed by the pluralistic methods employed, they could only be achieved by truly major developments in Philosophy, along with great experiments undertaken to demolish the current fictions, AND, crucially, the removal of Plurality from its universally accepted and dominant position.

A full 2,500 years of Plurality-based methods and conceptions had to be finally terminated, but such a change is much easier said than done – and is made even more difficult by the undoubted successes of the old stance in Technology.

NOTE: I feel I must quote Professor Brian Cox in his Human Universe BBC TV series, where he says, "The "Why" is easy, what we have to do is tackle the "How". That puts the position of present day pluralist Science very succinctly, I believe.

For, in Technology, the reasons-why was not considered to be as important as how to get the required results. So, the undoubted contribution of Technology to the Modern World far outweighed the criticisms of the philosophers. It was very similar to the dismissal of Zeno all those years ago! To suggest that a much more difficult approach had to be pursued, was never going to be listened to, by those who were doing very well out of the old approach, especially as its credo was that the laws of Nature were extremely simple, and in any contention between theories, the simplest was likely to be the closest to the truth! [Which, of course, is only true when what is being considered is an Ideal Version]

Nevertheless, what are now necessary are two transformations with respect to Science.

Pragmatic methods in Technology dependant upon a pluralist approach will STILL be necessary. But its role in explanation must be rigorously exterminated, forthwith, and its direct opposite stance, that of Holism, must be substituted. It will, indeed, be a major revolution.

For since the advent of Science, not only Theory has been imbued with Plurality, but also the whole methodology of Experiment too. The way to investigate has always been to carefully FARM situations to remove as many confusing factors as possible, and to thereafter hold-it-still to allow the extraction of Eternal Laws.

We have always, experimentally, constructed situations in which Plurality was almost true, and when we couldn't remove everything, we tried to leave only those that would tend, over multiple runs, to cancel out in averages. The final pristine Laws were elevated to Natural Law status. But, though they were Eternal Laws, that wasn't in Reality: it was only in our carefully arranged piece of Ideality – the World of Pure Forms alone that they appear to be true. But, that is NOT what we believed, is it?

And, we got away with it, by only using those laws in the exact same conditions in which we had extracted them! Scientists were proud of their undoubted skills in constructing such experiments, which they interpreted as revealing hidden Natural Laws, rather than producing them! And, thereafter, it would always be assumed that these were, indeed, the reliable Laws of Nature, applicable everywhere, and in all circumstances!

NOTE: The most amazing example is the almost exclusive use of High-Energy Accelerators to find out about fundamental particles. The conditions inside these amazing engines, are such that they probably don't exist anywhere else, After all they are an attempt to create a piece of the Big Bang, for investigative purposes. And yet, what they learn from this "World" is interpreted as delivering what is basic for the whole Universe, The most amazing result was when I suggested a particular particle, which believe it or not was actually discovered at the Tevatron at Fermilab, but there it was entirely unstable. Can you guess what I was told; "Your particle is impossible because it is unstable!" But. Where was it unstable? In Ideality I believe!

With such a well-entrenched system, in all aspects of Science, the only way to terminate it would be to explain what was inexplicable by the current standpoint. That has to be our task!

Of course, it cannot merely by a switch! We didn't get away with pluralist science for centuries without a good reason. It wasn't that the laws so revealed were wrong: it was that they were simplified and idealised versions of the

truth, and we were able to use them by always constructing the appropriate circumstances for their use, in which they did indeed work. But, of course, we were idealising both the laws and the context. It was a very human solution to a truly major difficulty. We couldn't directly address Reality-as-is, so we brilliantly reformed pieces of Reality into situations that we could deal with, both in our investigations and in our uses.

But, there was more to it than that! The idealised abstractions extracted from Reality in those specially arranged conditions, were NOT in truth natural areas of Reality, formed by the interplay of natural laws, but, at the same time, they were also NOT pure inventions either! They did, indeed, contain something of value, which could be both used in production and also in theoretical developments. but only to a point! They were never the Absolute Truth, but had what we term Objective Content – aspects or parts of the truth, that were related to very special conditions ONLY!

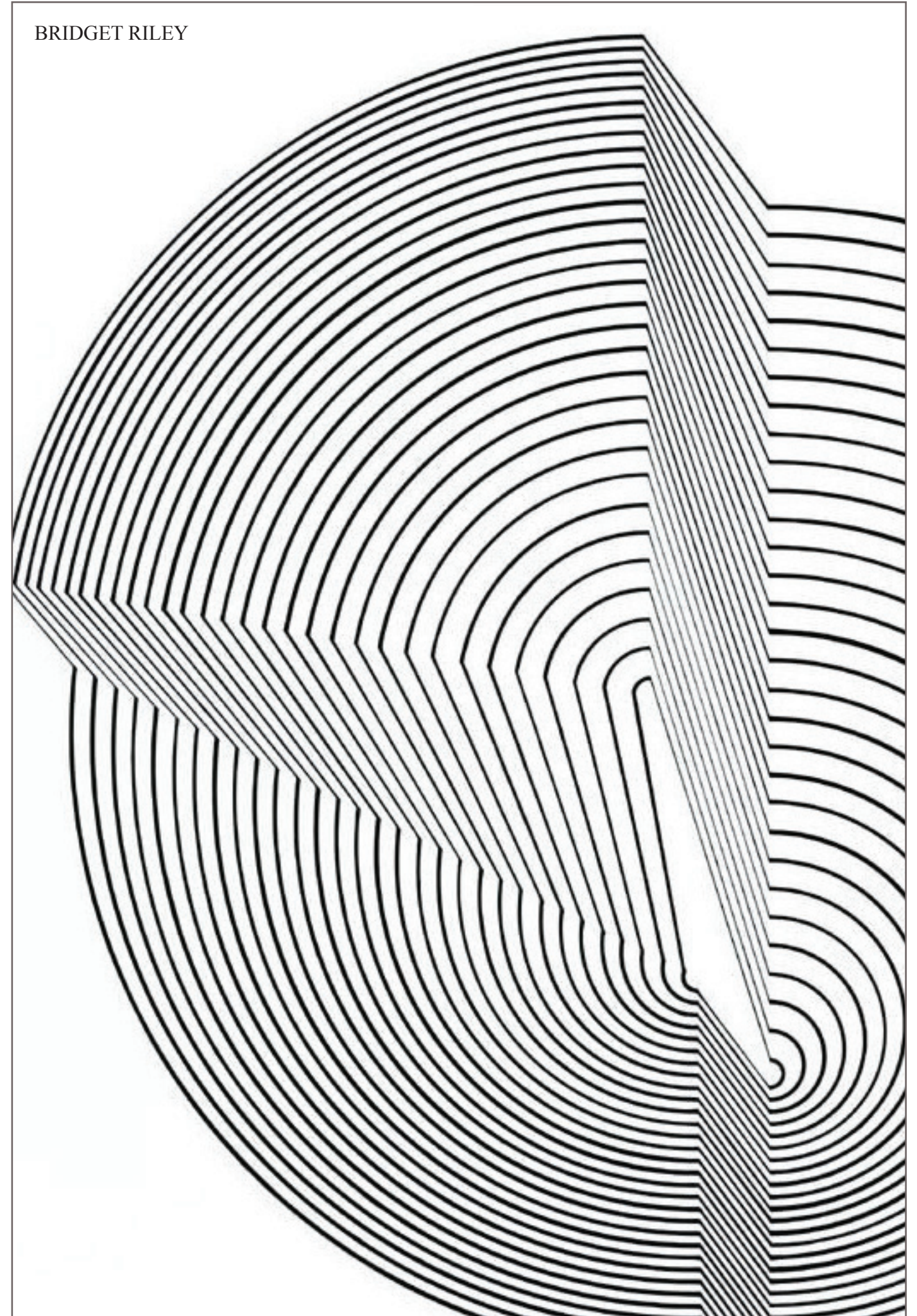
So in misreading them as Eternal Natural Laws (independent of their context), we did always lead ourselves theoretically into unavoidable dead-ends – impasses, where our "supposed truths" led to total contradiction.

Clearly, the versions of Reality that we dealt with were actually limited in their correct application, and in their truth. Indeed, it was, and will always be, true of all Man-made abstractions. They are, after all, simplifications and idealisations based upon very special and unnatural grounds. So, confronted, as we always will be, by these inevitable contradictory impasses, we have to ask, "What is the character of all these impasses? Can we do anything about them?"

As already mentioned, Zeno, right at the start of the establishment of Philosophy, described an exceedingly revealing impasse in considering Movement! The abstracted concepts of Continuity and Discreteness were just such idealised extractions and he proved it in his set of Paradoxes. Sadly though, it took another 2,300 years for this to be taken further, and a possible method of transcending it revealed. It was achieved by the German, idealist philosopher Frederick Hegel, who took as his area of study as "Thinking about Thought", and he too realised the limitations of all Mankind's abstractions. But, he also noticed that impasses regularly occurred, which, in Thought at least, could, indeed, be transcended.

The trouble was that to get to the bottom of a generated impasse, it wasn't enough to merely address the contradictions themselves. What had to be done was to reveal the underlying assumptions, and even principles, on which a Dichotomous Pair – like Continuity and Discreteness were based. It was these that had to be criticised, to find out what was wrong with them, and then replace them.

BRIDGET RILEY





This method, termed Dialectical Thinking, could only be attempted if another crucial change was also made. The Principle of Plurality had to be dumped, and Holism introduced to replace it.

The search for Eternal Laws was a myth (suitable only within wholly stable situations) and the actual, mutual modifications of all objective factors had to be grasped and addressed. Things changed due to context!

We had only managed to believe we had eternal laws in our hands by having constrained investigative circumstances, so that things appeared that way. And, our considered confirmation, that we had it right, had only occurred by replicating exactly those same conditions in USE! We had to jettison our concepts of eternal laws, and instead imagine complex mixes of mutually-modifying factors, which could produce very different outcomes if taken far enough. Our whole conception of Reality had to change.

Of course, this had already occurred in some areas of Science. Charles Darwin's Origin of Species had already taken a holist route, and in the higher Sciences of Consciousness and even Society, such an approach could not be avoided. It was only down in the depths, at the supposed sole basis of Everything (Physics) that the old approach still dominated!

Yet, these revolutionary contributions in Philosophy had been made by an idealist, Frederick Hegel, whose remit was wholly confined to "Thinking about Thought", so his solution was wholly cerebral, and wasn't helped by Hegel's conception that the Truth of Reality was to be found entirely in his Absolute Idea – accessible, in time, by his methods entirely confined to Thinking. Of course, it wasn't enough. And though a bunch of his energetic disciples – termed "The Young Hegelians" were quickly active, they too found the direction to be insufficient.

A revolutionary proposal was put forward by the leader of this group – Karl Marx, who suggested that the limitation also included the idealist stance, and proposed a major switch from Idealism to Materialism. The gains of Hegel were to be maintained, but used in a different way as Dialectical Materialism.

The contents of human thought were NOT entirely determined internally, but were also determined externally by physical and social conditions. And, of course, he was right. But this interpretation certainly threatened those in power – all the more because of the recent French Revolution, and hence, ever since, that version has been strongly suppressed.

You cannot isolate the Thinking of Minds from the Reality in which it was happening, and vested interests also made for steadfast positions – nothing to do with Hegel's trajectory.

In addition, the switch to Materialism meant that everything was in a material World, and that Hegel's discoveries were not only true for Thinking, but also for all developments, including the Origin and Evolution of Life, and the same for Society and its developments too.

Indeed, Hegel's transcending of impasses, even occurred in Society as Revolutions. Marx's dangerous developments could not be allowed!

There was more to all this than purely mind-based processes. The World, and particularly the Social World of Mankind and its power divisions would have a major influence too.

The Nature of Abstraction

Or how we internalise the real world

We have, on one hand, an Independent Reality, and on the other our Abstractions from that Reality, converted into forms that can exist in a Mind - as some analogue of those things extracted from that complex world.

And, if we define Abstractions NOT as real features of concrete Reality, but instead, as simplified and idealised reflections within the Human Mind (by which we mean attempts to internalise and understand real phenomena), we have to be very clear what it is that we think about. We definitely assume that we are thinking about the concrete phenomenon that we had observed, but of course, that isn't entirely true. We can never pack into our mind the full contents of those phenomena, but only a simplified reflection of them, determined by the mirroring implement we use, and manipulative processes based upon previous such extractions.

Now, there are many things to consider with such internalisations. Quite apart from the social verifications, that make final forms common to many minds, we still have to explain why such abstractions are so useful, as well as what they actually consist of, and what they constitute as a whole collection (or even some sort of "system") within their current residences within our minds. Indeed, this has been realised, time and again over millennia, and has caused Humankind to oscillate regularly between the true basic standpoints of Idealism (there is only the mind) and Materialism (there is only matter). For the accurate communications of one into the other seem to be impossible.

But if we stop at merely calling them invented constructions of thought, it would get us nowhere. We would inevitably end up in pure Solipsism, with no concrete gains with respect to the relations of these things to a most certainly existing concrete Reality.

There is undoubtedly, some form of relation between them, and the Reality from which they were extracted and then reconstructed. These objects of the mind will be imbued with two sets of determinators; first, the real world things that elicited them, and second the properties and stored experience of the mind itself. And, they are certainly NOT the same.

The problems arise from both the processes involved in that internalisation, and also in the capabilities of the mind in making relationships relevant to that outside world. There can be no doubt that there has to be some measure of Objective Content in an Abstraction. Something of the Real World must be capable of being both reflected in and

stored in the brain, with enough correct Objective Content to be at all useable. Yet, this will have to, somehow, include features of that real world situation in forms suitable for processing in the mind, but they will always be guaranteed to be insufficient to completely reflect those real world situations. The fact that anything can actually cross that divide is something of a miracle.

However, the actual processes of simplification and idealisation are gradually becoming clear. The myth of internalising Absolute Truth is also demolished totally. Whatever we internalise will be at best the maximum Objective Content currently possible. That is entirely what we deal in.

Now, let us be clear - not only does the Human Mind perceive real world phenomena, but it also devises and directs real world actions too. So, whatever internal processes the Mind is capable of, they will have been generated by a long history of such interactions, not only by the individual concerned, but in what has been coded for in that person's genetic material, passed down/learned and what has been settled on in discussion with others in the same social group.

It is just such a nexus of internally present capabilities that deal with perceptions, and determine the kind of abstractions that can be involved. But, they will all be purely cerebral concepts. So, how can they possibly contain any concrete objectivity at all? Clearly, minds have a history of development, and are certainly NOT wholly internally determined. For, any animal to survive, and even prosper, this internal processing unit just had to reflect the outside World very well indeed. It was certainly a product of evolution, and in the case of Humankind, perhaps the most important!

Well, there is a category common to both Thought and Reality - It is Form! When we say that there are TWO objects - that is both meaningful in the real World, and in Thought. Formal relationships are quite capable of being conceived of in the case of "TWO" - because it is simplified - totally drained of everything other than its "twoness". And, also for other formal extractions, because they too are always idealised - that is converted from real world determinators, with all their variability, development and depth, and turned instead into fixed, pure forms. These can, indeed, be elements of Thought.

Remarkably, there are rules, which pertain in the real world to do with form, though they are NOT eternal laws, but current relationships in a constantly varying World.





But, and this is crucial, Humankind has found ways of making them appear eternal, by holding a context as still as possible, after also removing as many affecting variables as possible. Humans have learned to tailor or farm Reality so that these formal relationships appeared eternal, and could be internalised in Thought, though stripped of all but a simplified and idealised remnant. Once internalised in Thought, they had to become totally ossified into static or “eternal” things that never changed.

However, this transformation isn't a ruining tragedy, for as the farming of situations in the real world proved, even such idealised versions can be close to what actually occurs there, but will only remain appropriate there for a time, or alternatively, if the real world ideal context is maintained throughout any actual use.

So, what the mind does in making Abstractions, is it takes a kind of selective snapshot of an aspect of Reality, suitably simplified and idealised and made still, which can then be thought about and related to others, in a World which can exist in Thought – a World of Pure Form alone.

This philosopher, Jim Schofield, has given this category of Thought the name – *Ideality*, because it is not a mere collection of abstractions, but an actual idealised System of such formal relations, with its own rules and laws. But, they are NOT the same as the forming rules in unfettered Reality, which are never eternal, while those idealised in Thought certainly are!

The usefulness is like the use of a photograph in understanding a scene. It certainly does not lie. But, it is a restricted and ossified view of Reality, telling us only something about that frozen moment: a perception. And, we must make an initial effort to decode what is actually going on in this process. This must be tackled before we move on to the next Phase; the Human Mind is not a fixed machine, but a part of Reality subject to evolutionary development and will change in its features, facilities and powers, as a result of its successful experience in the Real World.

The Myth of Equation-Based Theories

Why and how does Mathematics distort Reality?

Well, “Why?” is easiest to answer. Reality is distorted because Mathematics totally ignores absolutely everything except Pure Form, so how could it possibly reveal a fully comprehensive description of anything that happens in the real, concrete World?

Now, Mathematics is not only solely concerned with Form, it also does not even deal with those forms that actually crop up naturally in the concrete World, but only idealised versions of such real Forms! There are no such things in nature as *perfect* triangles, squares or circles. Every single naturally occurring form is always a simplified and idealised version of what naturally occurs. Now, though that assertion may not be challenged, what certainly will be is my insistence that the same is always true of equations too. For then most would disagree, and cite the successful uses of such equations both in prediction and in use. But, when they do work, it isn't in ordinary unfettered Reality that we are talking about.

It is, most certainly, a very carefully organised and maintained Domain of that Reality, purposely filtered and modified to bring it as close as possible to present the idealised forms they bring in from Mathematics own ideal World of Pure Forms. Indeed, the famed Principle of Plurality is the basis for their whole arranged set-ups and methodology, for that principle and those experimental set ups provide the assurance for what they can achieve.

Mankind cannot analytically deal with totally unfettered Reality directly. It is both too complex and varies significantly from any of the idealised forms of the mathematicians. And, that occurs because actual Reality is NOT a sum of eternal Natural Laws as they assume. They have to make it approach that ideal by carefully and appropriately changed conditions - adjusted at length until it has been made to be as close as possible to that which will deliver a targeted ideal Form that it will then display clearly, and will allow to be extracted as such.

Now, this is important. Mankind never deals with Reality-as-is, for it is subject to no eternal laws at all. Scientists can, however, so filter and adjust the context that it does indeed get very close to obeying the aimed-for form. Reality has then been skilfully farmed-to-fit the required Pure Form, as Mathematics deals with it as one of the perfect elements of its World. Mathematics can only deal with idealised forms. It is NOT about Reality, but about a World defined by Mankind as the sum of all its idealised Forms.

Mathematics is the study of Ideality!

Now, this maybe disputed, until I suggest that they prove their case by using any one of their laws, directly, in unfettered Reality. And, they can't! They will only work in exactly the same precisely farmed conditions from which they were extracted.

The whole of Science and its employment – Technology, is predicated upon those tailor-made Domains. You can see why I call it “farming”. And, even that description does not reveal the whole of this myth. For, without the supposed truth of the Principle of Plurality, none of it would be possible! The Principle was defined to underpin this set of assumptions and methods. It defines all Natural Laws as separate from one another, and therefore eternal. All situations in Reality are then mere sums of eternal Natural Laws, and any farming of Domains, is merely a means of revealing true Natural Laws, by suppressing or minimising all the others present in a prepared ideal situation.

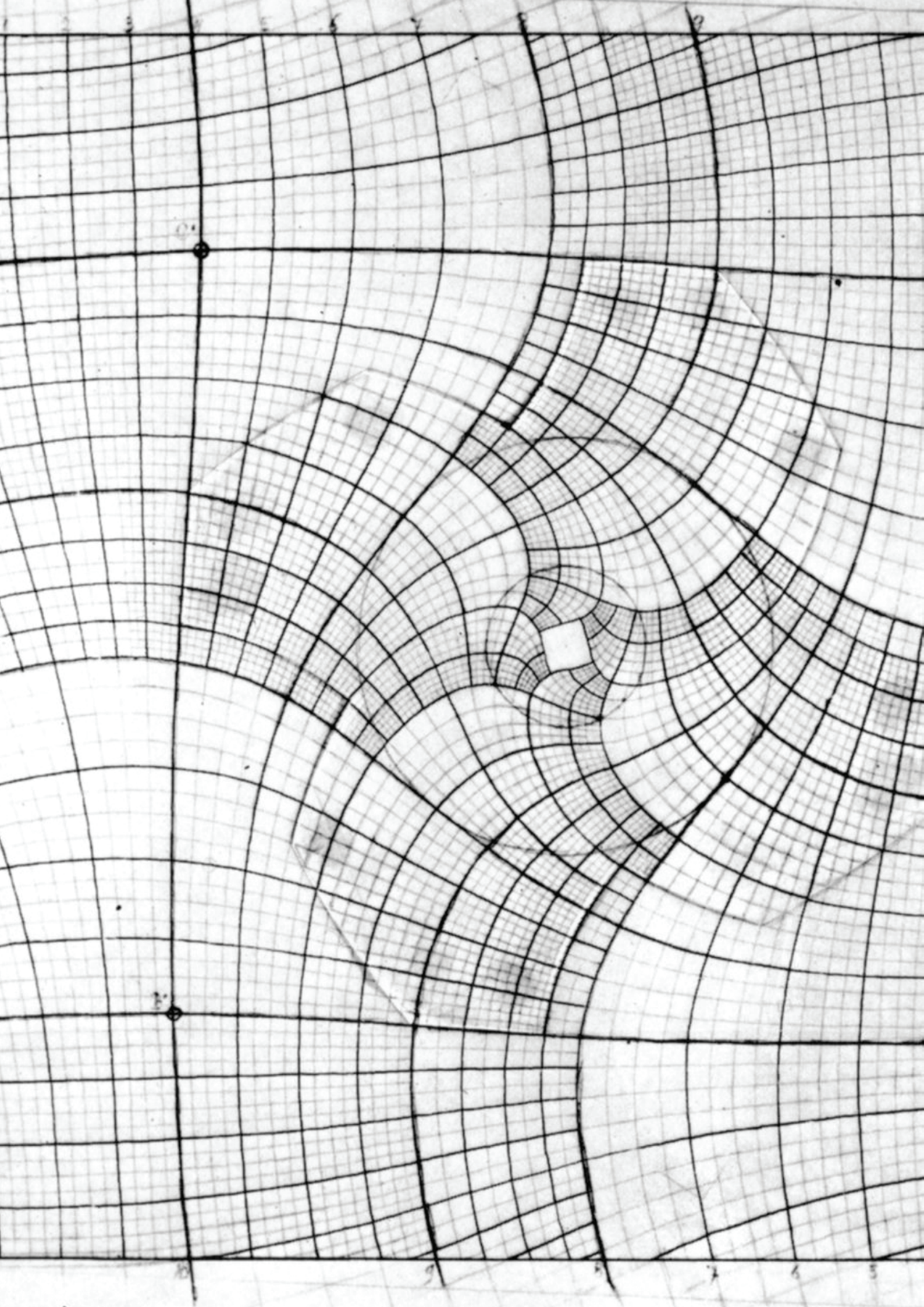
Theoretically, the acceptance of that Principle means that all extractions from tailored Domains, are then the same as act in unfettered Reality, but they have been clearly revealed by suppressing the others. So, this means that it isn't the context in Reality, which makes the real laws, but the sum of separate and eternal Natural Laws that produce a particular context. So, if The Principle of Plurality is correct, none of these laws, in themselves, can be changed. They will remain the same, and have remained the same throughout the whole history of Reality. There will have been NO evolution of relations. Laws found by the usual tailored means NOW, will have always been the same. NO actual evolution will have occurred, only complication. And, most amazing of all, even the Origin of Life is merely a particularly complicated mix of these unchanging laws. Oh, and of course, Consciousness and Human Thinking will be the same sort of complex sum too.

But, the Principle of Plurality is just wrong. And hence, that version engineered-for, by constructing an ideal experimental set-up, will, at best, deliver an idealised and frozen version of the “naturally variable relations” – as delivered only by that specific context. And, it will be different from that in other contexts, and even sometimes significantly so.

Our methods, both in experiment, and in subsequent theorising, ensure that what we get are, to put it simply, purely *abstract* forms – forms that are separate entirely from their physical causes, and as such, are NOT those made by such contexts in totally unfettered Reality.

We reached a fork in the path and chose abstract Laws as the causes of phenomena, and, therefore, can ignore the alternative route, which has physical features and





properties determining all relations. Once this decision has been made, there is nothing wrong with concentrating exclusively upon these abstracted relations, for they are the determining essences of what we experience. And, of course, the relations extracted will necessarily be the same wherever they occur. So what things we reveal in our carefully organised experimental set-ups are identical with what they are everywhere else.

Now, if these assumptions are mistaken, and the determinators of all relations are physical causes, then any discernable relations will vary dependant upon what the conditions are in which they are happening. At best, our “Natural Law” will be one version of a variable law that is only true in the exact conditions in which we found it. At worst the “Law” may well cease to exist in any form if the conditions cannot make it happen.

So, what exactly, do we have in our hands after a successful experimental investigation? It isn't a Natural Law! It is, on the contrary, a reflection of what was occurring in those particular conditions, idealised to be an “eternal law” occurring in other versions in many different conditions, or not occurring at all in others. And, not only that, but the thing taken as the determining essence, isn't even physically real: it is a purely abstract form only, and contains absolutely nothing else.

Now, admittedly, such reflections will contain something of the Reality which begat them in those conditions, but never the same everywhere! So, all such “extractables” do not exist in Reality as real entities – but can only exist in a man-made, parallel World of Pure Forms alone, and which is best described as Ideality! It is a separate, purely formal World, and contains only pure, idealised Forms extracted via purposely transforming methods from specially contrived Domains in concrete Reality.

Now, once this is realised, the equations of the mathematicians cannot be the driving essences of Reality at all, but mere formal and idealised extracted reflections of many real and mutually-affecting factors.

Yet, even such conversions can be useful, for they reveal that other World of Form alone, which certainly has its own rules. It can be studied extensively, and many useful things discovered. And, they can be used in Reality, as long as the producing context is correctly made available for that use. But, also clearly, the uses are limited! They are NOT universal Natural Laws at all, but specific to certain environments. Yet, if studied wholly within their World of Ideality, they can reveal many interesting properties and relations.

What is interesting, however, about what mathematicians do, is they take these forms to another even more abstract level, and build an ever-extending world involving only purely formal relationships. And crucially, much of what is

possible in Ideality is impossible in Reality. It is, after all, a man-made World devised to help in relevant contexts via intrinsic, formal relations. To extrapolate from Ideality into Reality is this wholly impermissible? The “tail wagging the dog” is certainly impermissible!

Now, what does this mean when mathematicians manage to devise forms, which seem to deliver more than any original real World efforts to investigate them can? Einstein's Relativity is an excellent example. It can deliver far more than the old Newtonian equations can, but to get them many things have to be ignored in concrete Reality, while others, solely extracted from Ideality, are brought in to effect-a-fit in problematical situations. And these extended forms work, as did the older versions, but they are still idealised, pure forms and NOT extracted from Reality, but on the contrary developed entirely within Ideality, and giving, in consequence, new predictions, which are then looked for in Reality.

The shouts of “Eureka!”, when things are found which seem to confirm the formal additions, are taken as a confirmation of the correctness of the changed formalism. But, these are even more so idealised forms: for they were suggested without a real-world basis, and for the reasons explained above cannot be the driving essences of Reality.

Yet, without a murmur, this inversion of the scientific process is universally accepted!

So, we are beginning to see a new paradigm, in which research is carried out solely in Ideality, and then “confirmed” in special experimental “confirmations” Pragmatists, who do not ask, “Why?”, and are wholly satisfied with answers to the (simpler) alternative, “How?”, and will use such developments without any concerns whatsoever, and just as easily put them aside when they don't work.

So, in spite of the fact that these formalisms always distort Reality, the fact that they allow success in rigidly defined contexts is considered to be sufficient. But, on inspection, the appropriate circumstances can be contradictory, for they don't make concrete Reality sense, neither are they always applicable. The user may have to try a few until he finds one that does work. And, that is considered OK! No, it isn't! To do that makes the user a technologist and not a scientist, for the latter's job is primarily to *understand* phenomena.

Contradictions indicate that the situation is not yet understood at all, and what has been achieved are purely pragmatic “rules of thumb”.

Indeed, as Frederick Hegel proved, when your ideas and principles lead to contradictions, it is because the underlying assumptions involved are wrong. He even had a name for pairs of concepts that were mutually contradictory, and

hence could not be correct. He called them Dichotomous Pairs, and insisted that no further progress in understanding was possible, unless and until, the mistaken assumptions, and even principles, were revealed and replaced.

Well, we now know something of what is wrong with abstract relations, taken from Reality by farmed arrangements. Let us be crystal clear! There is no space-time continuum involving four dimensions. Not in *Reality*, that is. Such a construct is entirely within Ideality – that man-made construction composed entirely of idealised abstract forms, with NO determining concrete context included. Einstein took his forms and attempted to get them to deliver what had been extracted from Reality, but, in addition, he added a great deal more – NONE of which came from Reality, but from the extensions that Einstein had added to Ideality. He used extended formalisms to describe Reality, rather than using Reality to explain equations! Thus, the beginning of the retreat, which ended up with the Copenhagen Interpretation of Quantum Theory, started, in earnest, with Einstein!

Now, all sorts of indirect, simplifying or idealising methods are OK, and can lead to effective use within appropriate Domains in Reality, but what can never be done is to invert the hierarchy, and put the abstractions as basis. That is Platonist! And it turns materialist Science into something very different – the very odd concoction of Idealist Science.

Of course, the early scientists were also religious, and disembodied Formal Laws did allow in a God by the back door! And, the “explanations” built upon ideal formal means of describing Reality, cannot be anything other than Pure Speculation. And, what is more, also guaranteed to NOT exist in concrete Reality. They will be, at best, pragmatic aids, but never Real Theory. To call the mathematical physicists of today theorists is total nonsense.

There is, however, another compelling reason why equation-based explanations can be useless. Whenever important contributions to phenomena are as yet completely unknown, and hence not included in formal attempts to fit the data extracted from Reality, a similar set of contradictory ideas also bound to ensue. The major error in the Copenhagen Interpretation of Quantum Theory is the leaving out of any content in the supposed space-between-objects. And, this too leads to many contradictions in the form-only based “theories”.

For example, many mind-numbing aspects of Copenhagen actually melt away if some sort of substrate is included in the present context. The many anomalies displayed, in the usual interpretation of the Double Slit Experiments, vanish if a substrate is included, which if both affected by particles directed towards the Slits, and thereafter as carried disturbances in that substrate (and ahead of the slower, causing particles) can reach the Slits first, go through

both, and interfere on the other side. So when the particles finally arrive at the Slits, they go through one or the other, and thereafter encounter, the continuously maintained interference pattern, and will there be deflected or not, depending upon their paths through the pattern – thus producing the necessary pattern on the detection device. And all this was achieved without anything other than an undetectable, yet disturbable and affecting substrate being added to the explanation.

Of course, the actual particle, delivering the composition of such a unique substrate, had been theoretically defined, and then found to exist, exactly as suggested in the Tevatron at Fermilab.

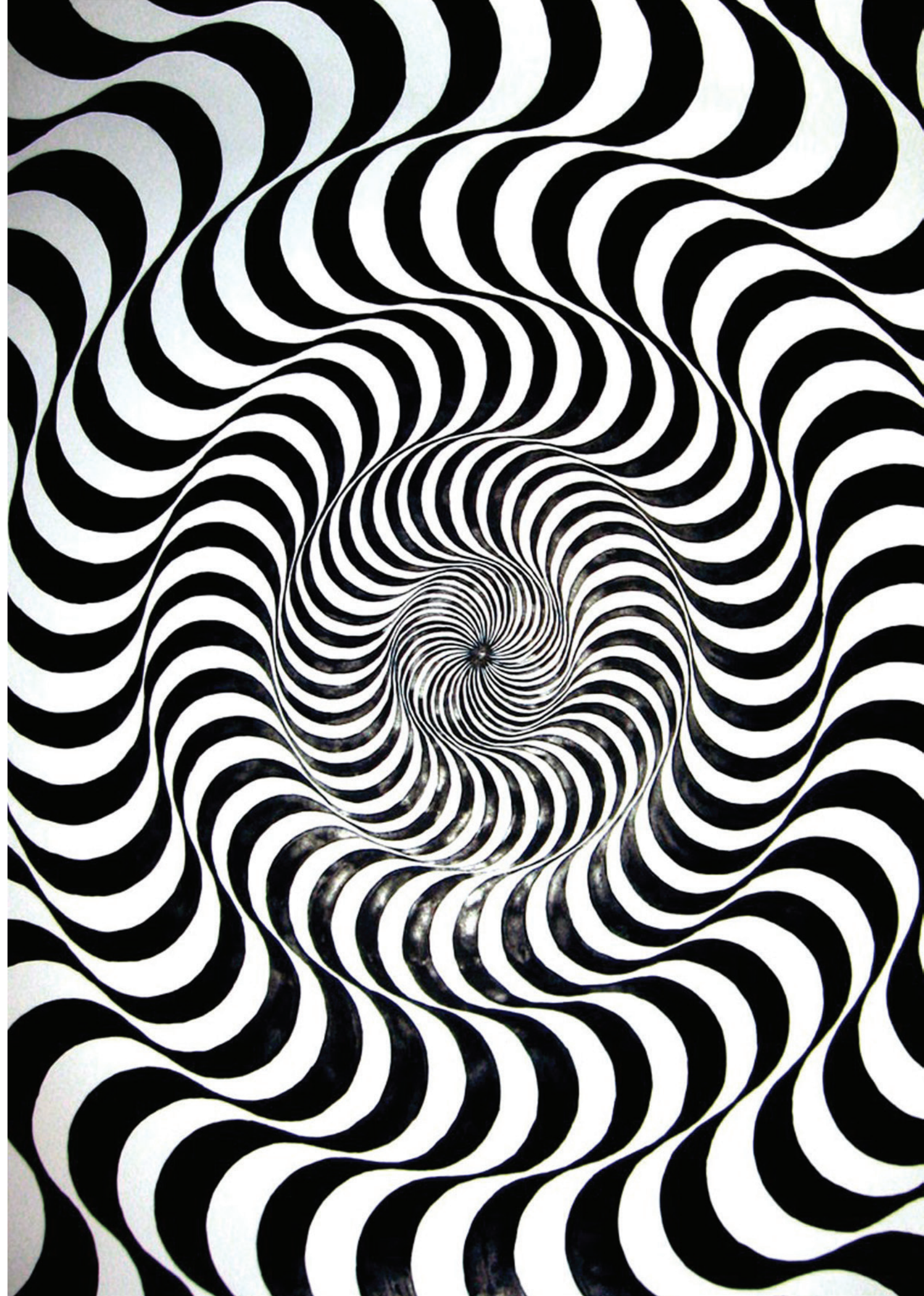
So, let us recap this alternative view of Reality, and what we extract from it, and perhaps a short visit to the historical events will help us to see what happened and why.

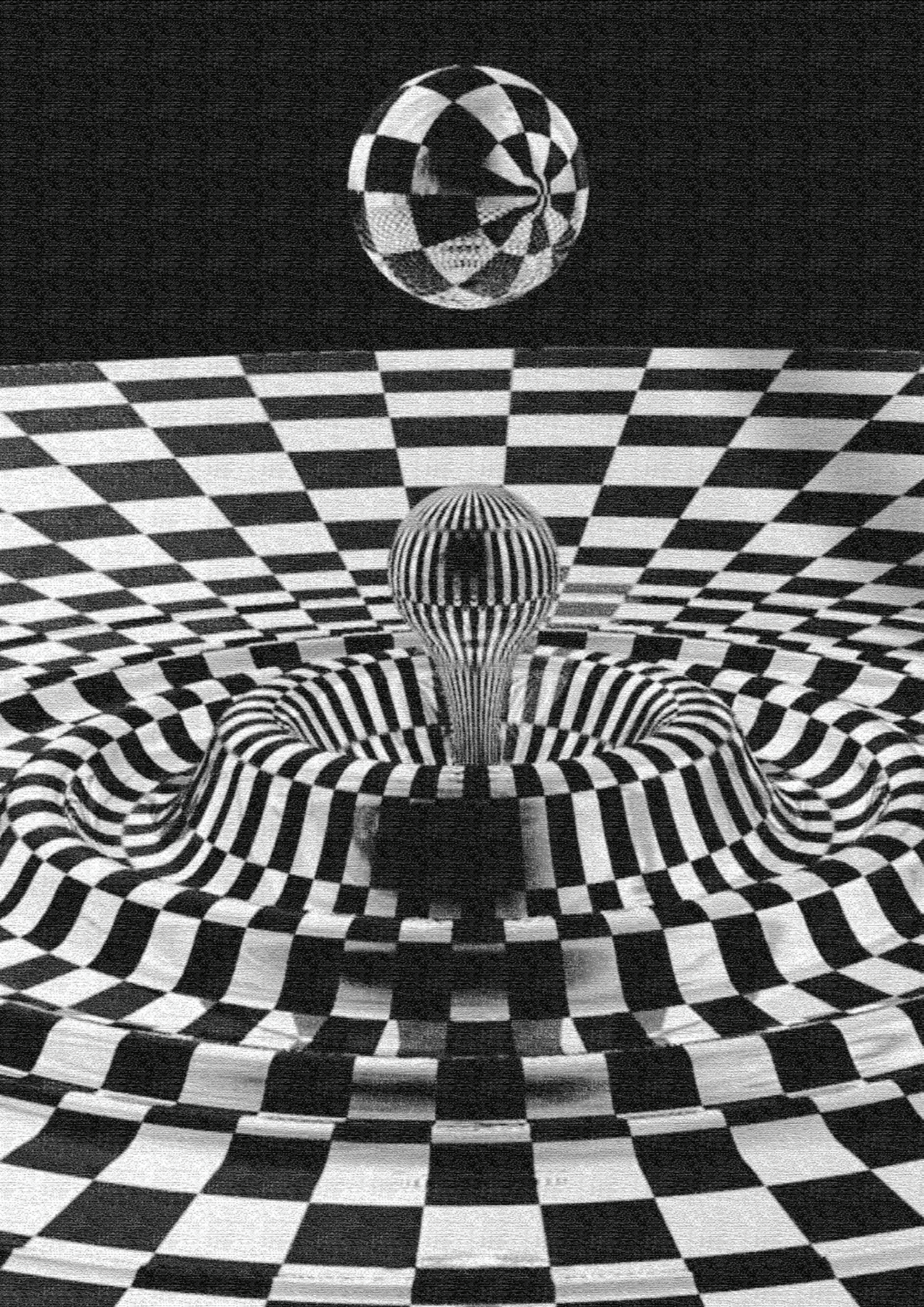
The ancient Greeks were those initially involved. They noticed Forms within Reality, but also saw that they were never available perfectly. They were distorted in some way when observed in totally unfettered Reality. And the Greeks drew the conclusion that the drivers of what happens in Reality were, actually, these ideal Forms, and the confusing variability was entirely due to irrelevant “noise”. So they set about extracting them, and returning them to their perfect states. They considered perfect circles, perfect triangles and many other idealised forms, and studied them as they “really are”! They had invented Mathematics, and this was long before they were scientists, and what is more they were able to reveal rules and relations in a whole range of these ideal forms.

In attempting to gather all this together into a consistent and comprehensible whole, they decided upon a set of simplified assumptions about the points, lines and planes involved. Via these bases they managed to establish a defining set of assumptions and worked thereafter ONLY within that set of possibilities. They had defined the very first version of Ideality, which became known as Euclidian Geometry.

But, having revealed all of this, and knowing how, in spite of its inadequacies, Mankind has managed to use these purified forms in tailor-made contexts to transform the World, it is also clear that the parallel requirement to understand has been destructively damaged. So, what has to be done to remedy this situation?

We have revealed that the Principle of Plurality has been the cornerstone of the usual methodology and extracted forms, but also that it is untrue. What is the alternative to that principle, and how might it reinstate context – concrete Reality, into attempts to explain phenomena? Well, the only alternative to Plurality is, of course, Holism – the standpoint of the Buddha, and philosophers such as Hegel and Marx.





So, can there be a Holistic Science? The answer is “Yes!”, but it definitely involves a great deal more difficulty than it was in establishing the pluralistic alternative. For, a fully mutually-affecting set of varying factors making up any relevant content, has to be involved, and that is incomparably more complicated than the sum of separate and eternal laws that is involved in a pluralist methodology.

Can such a varying and mutually changing amalgam be modelled at all meaningfully? The answer may be once again “Yes!”, but with such a great deal of difficulty that, so far, it hasn’t yet even been started to be constructed.

Even Stanley Miller’s brilliant proto-holist experiment on the early steps in the Origin of Life, though it successfully delivered amino acids, and hence proved his point, was deemed impossible to follow up.

The most famous prototype for a holistic approach was that employed by Charles Darwin, and, ever since, the more obvious arenas for developing such an approach have been all in the higher level sciences - from Biology via Sociology to Psychology! Darwin did manage it, but considered it so different to the usually employed methods, that he didn’t publish his ideas for several decades. These sciences cannot afford, as both Mathematics and even Physics can, to deal in “ideal forms” All the gains made in Holist Science have been made in these disciplines, and the concept of an Emergent Episode in which all evolutionary changes take place was derived initially from Social Revolutions, and only later applied to all levels of development.

Indeed, as current researches have demonstrated, to even begin to put together any sort of holist methodology, the whole edifice of assumptions, methods and principles of the pluralist alternative have not only to be completely demolished, but an alternative which explains why it has been so useful for so long, as well as the construction of a completely differently based alternative has to be soundly established, before a methodology can even begin to be constructed.

For example, the alternating phases of long periods of Stability, interleaved with very short Emergent Interludes must be explained in detail. And the whole set of relevant issues, such as Quantitative and Qualitative Changes must be addressed. Indeed, the means by which stable systems are both established and maintained must be addressed. And no account would be given credence unless it could lay out in sufficient detail the Phases of an Emergence through Crisis and collapse, to Chaos, and from seeming Oblivion via Competition and Construction phases to wholly new levels of Reality – such as occurred in The Origins of Life and then Consciousness.

Frankly, it has taken this researcher some seven years to achieve some necessary initial steps. None of which are the evident concerns of the vast majority of scientists.

And to compound the difficulties, though pluralist techniques must be roundly criticised, it must also be explained why they work most of the time, and why they will still constitute an important part of experimental methods.

For, they must still continue to play an important role in experiments, while, at the same time, totally banished from Theory. Pluralist techniques will still play the major role in technological exploitation of all scientific discoveries, but will need surgically cutting out from all explanation. The breakthrough will not be in investigations wholly contained within Stabilities, but will be making the most revolutionary contribution to both Qualitative Changes in General and Emergences in particular.

The almost intuitive attitude of looking for “driving essences” will be terminated, and the serious study of emergences and the appearance of the wholly new will certainly completely change both sub Atomic physics and Cosmology. Finally, a whole new experimental approach, based upon Yves Couder’s experiments will be developed as a “constructivist alternative”, and will totally revolutionise the explanations of all developmental change at all levels.

Abstracted Forms I: Quantitative

There is little doubt that the most important intellectual achievement of Mankind, in its attempt to make some sort of sense of Reality has been in the extraction of abstractions from that confusing Complexity, in all its many aspects and forms. The very first of these involved the noticing and extraction of patterns that often recurred within that complex mix, though only very rarely were they simple and immediately clearly evident.

So, from the outset, such a process had, necessarily, to involve more and more control of increasingly limited situations, which were necessary in order to bring those patterns out as clearly as possible, and therefore enable their extraction, and their subsequent formulation into symbolic equations.

Indeed, overtime, Man got so good at these methods that they became the established technique for what later became Science. But also, from the outset, these abstract forms begat an overall approach – a discipline, that was not predicated upon Reality-as-is, but solely upon these organised-for and extracted abstractions alone. The “significant content” was deemed to be solely these hard won essentials.

Indeed, a parallel World of the very Purest Forms (and resolutely absolutely nothing else) was gradually accumulated, which became not only a vast repository for all these \pure Forms, but proved also to possess inter-relating rules about them, plus a consistency, which allowed methods of proof to become established. And, these then became known as Theorems, which could also be used to reveal many more properties of these totally disembodied Forms, as well as their relationships with one another. A whole system was being erected!

This truly magnificent discovery and system came to be known as Mathematics. But, it must also be stressed, it was never about concrete Reality as such, but only about the Pure Forms that could be made-to-be displayed by very particular “farming” of real situations, which were absolutely necessary to effectively suppress as many other confusing components as possible. And, if this was successfully achieved, a Form would be clearly displayed, and its extraction made possible, via an organised sequence of measurements. Thereafter, these forms could be treated entirely in their own terms alone! There would be, and could be, NO references whatsoever to the actual concrete nature of that Reality from which they were taken: the whole methodology was to leave all that behind and consider only the purest, disembodied Form, and nothing else!

Clearly, the collection of Forms, and their possible manipulations and relations was ONLY about this parallel and purely formal World, which I have termed Ideality!

NOTE: It was in an effort to reveal *The Processes and Productions of Abstraction* that this researcher revealed a remarkable exception to most abstractions, which instead of the usual, and imperative reference back to concrete Reality for confirmation or rejection purposes, there were instead processes that did not involve such a confirmation loop, and went directly on into this now evident parallel World. It had to be differentiated from Reality, and in my final illustrative diagram I termed it Ideality.

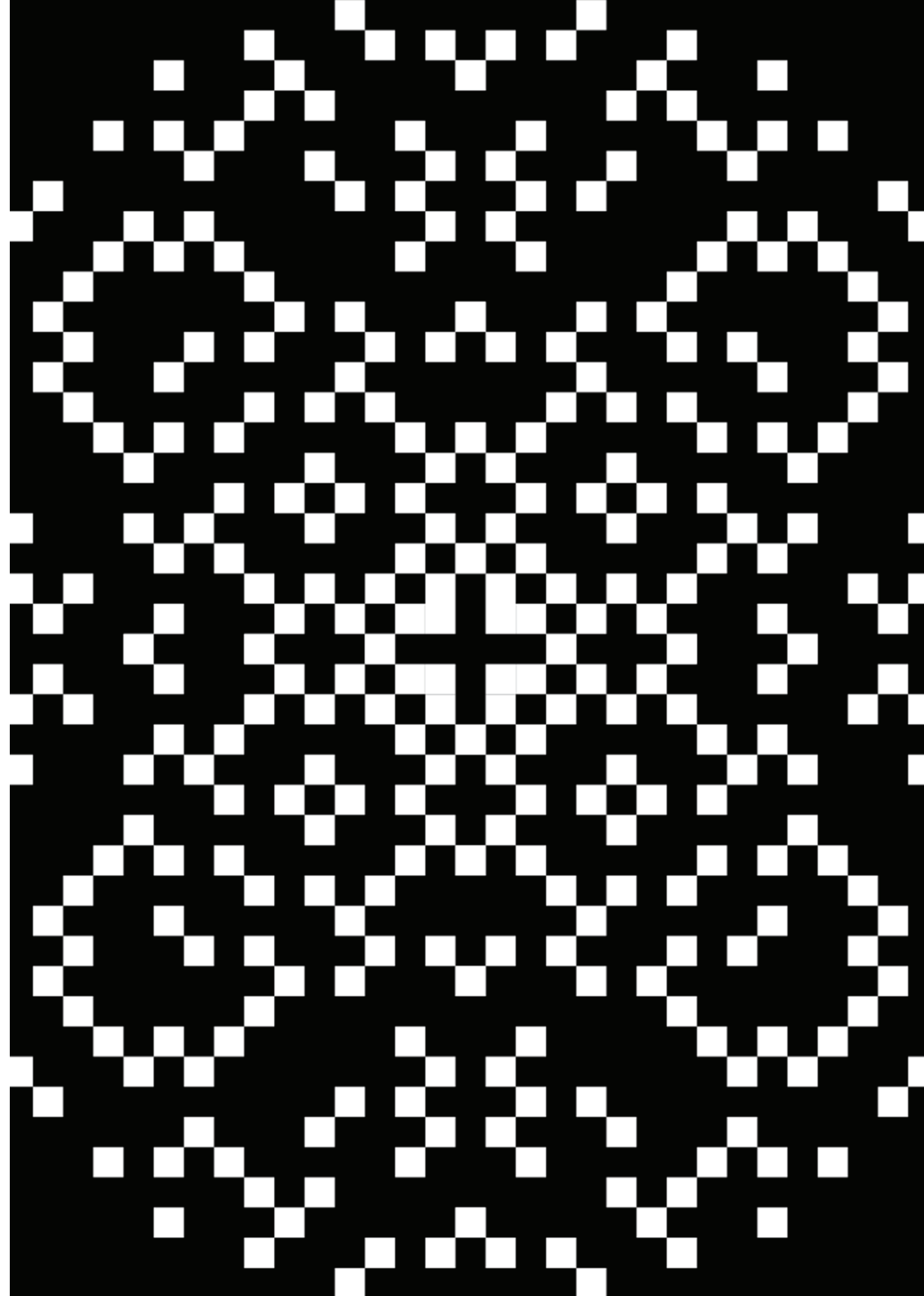
Now, all this doesn't mean that Ideality is either pure invention, on the one hand, OR the purest, determining essences of Reality, on the other. It is certainly derived from Reality, and hence contains something from that Reality, but it also, most certainly, involves disembodied, purified patterns - idealised versions, made that way by the means used to reveal them, which didn't, and indeed couldn't, exist in exactly that way in Reality-as-is: it had been transformed to disconnect it entirely from concrete Reality – it was now Pure Form alone.

Now, of course, there will be an immediate chorus of disagreement, coming from the fact of the undoubted source of these Forms. They certainly weren't just invented. But, they did NOT include what made them - what modified them in concert with many physical causes, OR crucially the factors that would remove them from continuing to persist – that would end their roles in a complex, physical Reality.

Thus its ONLY relation with concrete Reality must be as a Reflection. Ideality is solely composed of form-only reflections of Reality, and only when it has been constrained (farmed) to effectively deliver close-to-ideal forms.

But, nevertheless, it was, of course, both an obvious, and a necessary, step to take. To find such perfect forms in there, even if it took great contrivances to reveal them, and they would naturally elicit the conclusion that these were the driving essences of Reality, and Man had devised effective means of revealing them. But, to then assume that Reality is entirely and exclusively, composed of a multiplicity of these forms, is certainly an idealising hope - indeed, a platonic view of Reality!

And, the almost universally accepted Principle of Plurality, which always (and necessarily) has to accompany these methods, and incorrectly, sees them as wholly separate and



unchangeable essences. Whereas, indeed, they are the very opposite! The primary creators of these (and everything else in Reality) are the concrete, physical contents of that Reality, which are so complex, and mutually affecting of one another, that it is they, which produce these forms, though always, and ONLY, embedded in a self-modifying nexus of multiple mutually dependant factors.

Let us be clear! One view sees the Forms as primary and eternal (causes), while the other sees them as secondary and subject to change (primarily effects).

Perhaps the difference could be made clear by considering a possible 3D movie of some area of Reality (somehow including absolutely everything that is present and happening there. If, though, as a means of study, we can only extract a purely 2D “still”, representing a single, flat and discrete moment in that ongoing and multi-factor melee, all that we would be able to consider would be absolutely “still things” – absolutely no changes could possibly be included in that “still”. So, what we get, and investigate, would be totally unchanging things. And such a “reflection”, though by no means perfect, does show one of the ways that Mankind gets seemingly “constant” things from an ever-changing real World. For, in any detailed study of such a limited extraction, there would be NO dynamics whatsoever. Even considering a whole set of such stills, there would be seemingly recurrent Forms (maybe of very different changing processes) but only available by such methods as still and common patterns.

So, many of our methods of serious study do very similar things to Reality, in that they force them to be represented by forms that have ZERO dynamics: each of them could be instants in a whole range of different real, qualitatively-changing processes.

For, the only useable method has been to hold as many things as constant as possible, in order to extract some revealed pattern, where actual totally unfettered extractions were not only very difficult to deal with, but also usually totally unreliable too. So, as Mankind grew in the skills and control necessary to stop Reality varying, we then considered the things that we were then able to extract as being the real things, whereas they were always more like the momentary “stills” described above, and hence had the very same weaknesses, when it come to reconstructing what was actually going on in unfettered Reality.

So, when handling these “Eternal Laws”, which we considered to be the determinators of Reality, we always thought that they were separate and eternal components that together delivered Reality-as-is. They didn’t, and couldn’t, because they were falsely turned into these idealised and separate, eternal and form-only laws. They were never that!

It was our methods of access, and our subsequent interpretations of inadequate data that led us astray. Now, it wasn’t stupidity that reinforced these mistakes. The universal presence of stable, seemingly unchanging situations supported that interpretation too. And many of the rates of real change involved were either too slow, or much too fast, to be available to our methods. So, a good approximation in an analysis and even a use – that was being carried out FOR NOW, was the assumption of constant laws, and even though they were not what we considered them to be – that is unchanging and eternal. We could still get away with them, in our constrained ideal domains, and get their predicted results. We considered that we had indeed revealed the “true content” of situations!

So, in spite of their modifying methodology, Mankind had learned how to abstract from Reality, and, via the necessary constrained Domains, predict with confidence and produce with reliability. So, the belief grew that Reality was a coherent and conceivable admixture of our extracted “eternal contributions” – as revealed in highly controlled situations. He had learned how to extract, and the fact that these were often purely formal relations, caused Man to term them Natural Laws.

Now, while these abstractions were indeed brilliant, they were also guaranteed in the long run to be misleading. The process of abstracting from Reality was a major step forward, but our methodology diverted them into “static truths”. We had brought Reality to a stop, and then extracted these believed-to-be “eternal essences.

What still had to be achieved was a way of doing this while letting Reality “carry on”. We had to develop abstractions taken from, and revealing, a moving World. We had to learn to deal with abstracting the dynamics and the creations involved.

We had cracked, by implementing stabilities, the Static: we now had to devise ways of dealing with the Dynamic! And, after over 2,000 years of doing the former, doing the latter was seemingly impossible. Now clearly, no one could consider the World as “entirely stable”, for all sorts of things were changing all the time, and with the Calculus of Newton and Leibnitz, varying quantities were also brought into this system too. Equations could include rates of quantitative change, and be used to predict varying quantities. Yet, these extensions were limited only to purely quantitative changes. Any *qualitative* transformations were never addressed.

For the changes in amounts of certain parameters could indeed occur (most of the time) without causing significant qualitative changes. We could have a “stable” World in which qualities did not change, while strictly scalar quantities could, and could do so without disturbing overall stabilities.

So, all change was considered to be essentially quantitative, and the system-developed stable situations could be extended via the Calculus to such non-qualitative variations. And these did massively extend what could be handled. Yet the consequences for Mankind’s understanding were also very restrictive, and often crucially misleading.

For Man considered that all of Reality was governed by eternal, unchanging laws, which delivered everything that there exists, merely by changes in the amounts of all contributing laws. Laplace put it in a nutshell with his definition that if all particles’ positions and velocities were known, then the whole future development of the World could be predicted!

Now, though that might seem insupportable, it was indeed the standpoint of the scientists and mathematicians. For, according to them, Reality had been brought to heel! And, by the construction and maintenance of appropriate Domains, eternal laws could both be extracted and then used predictively to some intended outcome. Even quantitative changes could be included. But when it came to qualitative change, that was considered to be merely due to domination via overwhelming amounts – Quantity into Quality no less! The passing of Threshold was supposed to “explain” such things! Thus the Development of Reality was NOT included!

We continued to attempt to analyse a clearly changing World, in terms of our clearly “static”, eternal laws

Nevertheless, not all of humanity were so constrained, many thinkers, and even artists, were aware of the problem, and attempted to address it, but scientists were locked into their methodology, and a consequent philosophical stance, not only for the reasons explained above, but because by holding parts of the World still, they could use their laws effectively. Technology grew at a colossal pace, because it could effectively use static laws, by imposing suitable conditions and maintaining them.

There were, however, a few scientists who did attempt to understand a World in motion - like Charles Darwin, for example, but they were not “technologists”, who got all the glory for their incessant flow of useful products.

Nevertheless, a general dynamic approach was not developed, and certainly couldn’t be produced, without a major philosophical breakthrough, and a rejection of a whole Culture of concepts and methods. The most fundamental bases had to be revealed and replaced, to allow the necessary revolution.

Abstracted Forms II: Qualitative

Now, the line taken in Abstracted Form I, was concerning the extraction of Quantitative Forms, which being about the relationships between scalar variables, could, thereafter, be formulated into form-only symbolic Equations. And, of course, such a set of techniques, objectives and uses were more generally termed Mathematics and Science.

But, such forms of abstraction do not, by any means, exhaust the full range of possible extractions from Reality. There are many other, quite different, forms of abstraction that arose in quite different intellectual pursuits both in the Arts and the Humanities. Clearly, not all extractable abstractions are purely quantitative, and indeed, among the quite evidently qualitative abstractables are the most important ones for Mankind's objective of understanding both his World and himself.

But, such a category is extremely broad, and will be very different, say, in Painting and in Philosophy! And the subtlety and power of these would certainly develop over time, and would never be as strictly measurable as the more straightforward quantitative types are.

The imperative behind these kinds of extractions were very different from those usually employed in the Sciences. Generally, the objective was often the creation of a reflection of Reality, which in its contained forms reflected things which were not only qualitative, and usually involving a process over time, whether that involved in studying a work of Art, a piece of music, or in a story line reflecting a living development.

In the Arts, for example, the imperative might be to be as accurate as possible in representation of some visual experience, or alternatively it might be to profoundly represent the characteristics of a God, and to do that by symbolic concentration upon certain accepted defining characteristics. It could involve purely formal considerations, which when taken to the limit becomes so-called Abstract Art. Many of these could also be simultaneously addressed in the same work.

So, abstractions of whatever sort in Art were never as rigidly defined as in Mathematics and Science. Instead of Pure Form being the main objective, Art used Form to convey other more important and difficult things. Art used Form for quite different purposes! Indeed, as a counter to Science, artists would tend to concentrate on the areas where Science clearly failed – in contradictory circumstances.

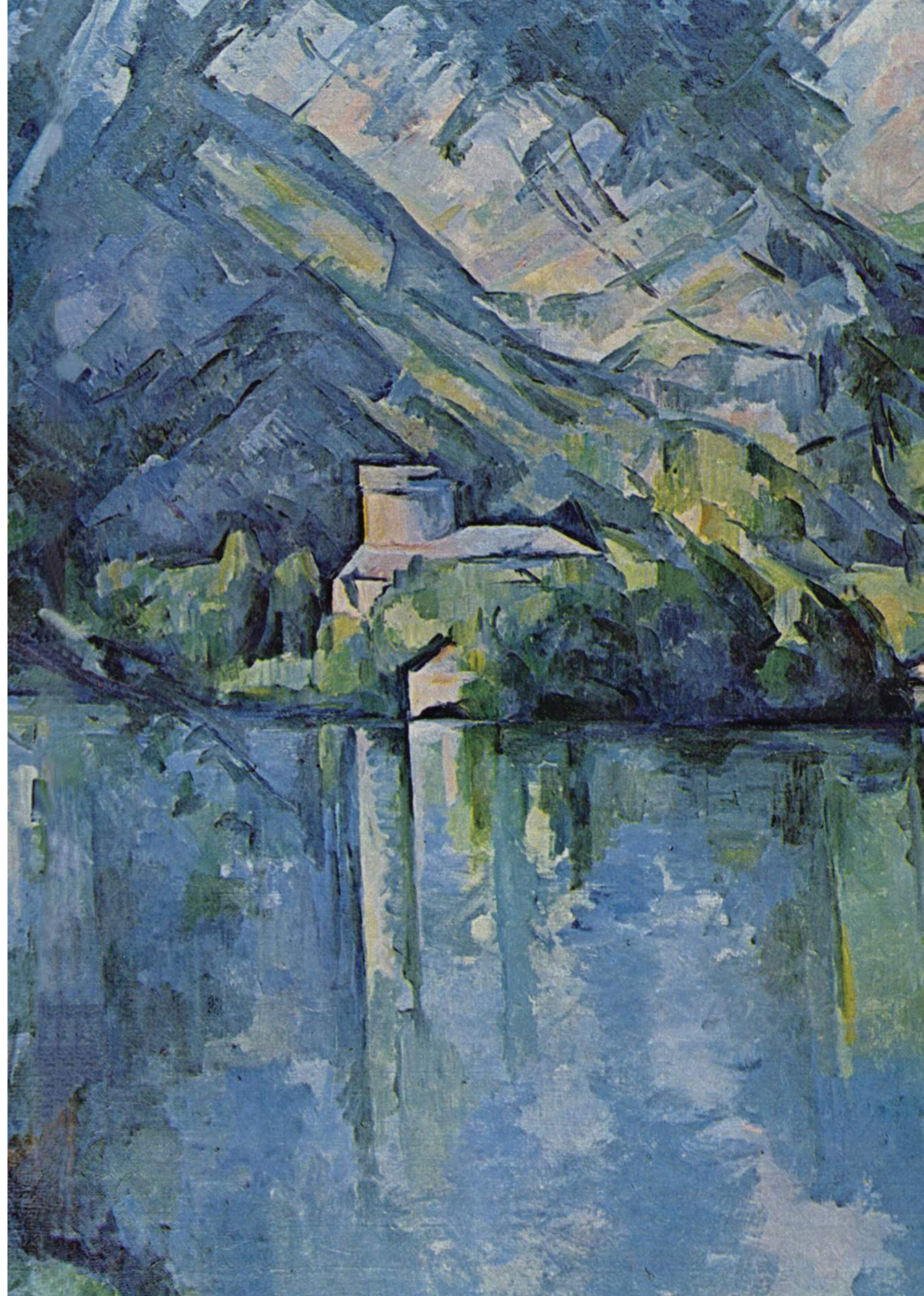
The subject cannot be comprehensively tackled, in a paper such as this, but a few initial points can be made.

NOTE: Perhaps it should be made clear that the writer, though a scientist and philosopher has also been a sculptor for some 45 years, and has also been involved in working on Multimedia Aids for students and professional Dancers and Dance teachers. He therefore knows something of both kinds of abstractions, but also knows enough to limit his contributions on the Arts, in a paper with such critical-of-Science objectives.

However, a few points can be made, if only to illustrate how very different are the imperatives in the Arts as distinct from the Sciences.

The truly great painter Paul Cézanne, in several important ways, revolutionised painting. He constantly investigated new ways of capturing the aspects of a landscape by overlapping objects, which he considered to be infinitely “more real” than perspective, for example. He also had absolutely no qualms about modifying actual colours from as they were in Reality, in order to create a “real depth” by “colour modulation”. He even integrated more than one observer viewpoint into his pictures, which replicated the effects of the movements of the observer in more carefully inspecting a 3D object. He intended that the observer be seamlessly led around the image, as if he was actually adjusting his position in the real world situation. So, effectively the actual sequence of different views took the observer “around” the contents of the image. The results confounded those who saw his paintings for the first time, causing many to say that they were the most “real” they had ever seen.

Now some, in talking about Cézanne's approach, emphasize his statement that the sphere, the cone and the cube were essential elements in a work, but they misunderstood his point. He was emphasizing that such forms were crucial in allowing an observer to effectively “create” the space they occupied in their conceptions of a work, which simply were lost with more amorphous or indefinite shapes. Remember Cézanne artificially created his “real space” by the various modifications to what was seen, when he made his paintings. He wasn't talking about Nature, with such statements, but about what was necessary to make his modifications work successfully. Cézanne didn't mean that a reduction to such forms revealed the essence of the things portrayed: he meant that when perceived as such, they enabled the most accurate interpretation of the actual space involved - by the observer!





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Other artists used Form to reflect emotional states, and thus elicited those in the observer of the work.

And, of course, Music - the most abstract and formal of all the Arts, and also crucially spread over time, got, perhaps, closer than any other to being the most generally applicable art to the widest range of purposes.

So, the Arts were evidently extremely human, while the Sciences (though they could not avoid the consequences of being a human discipline), strived to be as objective as possible, while dismissing the "subjectivity" of the Arts. As a physicist and a sculptor, myself, I was involved in both throughout my life, but to deal with Art as I do with Mathematics and Science is impossible.

In a quite different area, the artist and sculptor Amadeo Modigliani described Arts as "the articulation of Form". What a truly profound statement, because he was talking about all Art, so, it not only included my own art of Sculpture, but Music too. And, in my experience, he was certainly correct!

It is never the individual forms in a work, which convey the most important content, but the meaningful *transitions* between them. For, in a poor work they are totally meaningless, but in a masterwork they are the essential content, and portray things impossible to relate in words, and things most certainly absent from all Mathematics and Science.

NOTE: Only a couple of days ago, on BBC 4 TV channel, an old Monitor programme in which the composer Elmer Bernstein talked at length about Beethoven's Fifth Symphony, and compared that Master's earlier possible inclusions, with his final versions, it was evident that it wasn't the various figures or "tunes" that were significant, but how they articulated with each other to have an overall effect.

Clearly, we cannot treat abstraction in the Arts in the same way as we do in the sciences, because the usual "implied" purpose of those approaches is their subsequent and helpful uses, whereas Art is much more general and more humanistic.

There is, of course, yet another, purely verbal, discipline that is neither a science nor an art, but, within itself, contains not only all the aforementioned means of employing abstractions, but also indeed many more, and without doubt, the most significant uses of abstraction. It is, of course, Philosophy!

And, I include within this not only the philosophies of the western tradition, but also those of the Orient too, and particularly Buddhism, which is perhaps centred upon Mankind, but nonetheless profoundly important.

I decline to address that here as I am not a Buddhist, but I do subscribe to the Buddha's insistence upon Holism as the closest conception to the true Nature of Reality
NOTE: One particular philosopher, Karl Marx, I do feel competent to write about. But, perhaps that requires a different (and much longer) format and central topic, than being addressed here.

I have concentrated upon the Arts, when considering qualitative abstractions, because it is clearly the area, where such an approach is most clearly and consciously addressed. But, the consequent divisions of labour between the Sciences and the Arts is clearly a bifurcation in Man's attempts to deal with his World, and the ever deepening rift between these alternatives can never be a good thing. In addition, the imperatives of the Arts, tend to only allow significant contributions by the artists - starting from scratch, for the alternative, quickly demotes what is achieved into mere technique and a replication of prior revelations. This makes the Arts much more difficult to comprehend, and also rarely allows a consistent and clear progress in what is achieved. So, to merely note the dichotomy between the two approaches cannot be acceptable.

But, how, and in what context, can there be an approach, which covers both sides of this dichotomy? I have become convinced that the arena for such an attempt will have to be in Philosophy, at which both the Arts and the Sciences MUST be particular approaches.



Dialectics

Dialectics was a discovery of Frederick Hegel – the German Idealist Philosopher, who, some 200 years ago, considered his area of study to be Thinking about Thought, and realised that all our conceptions about Reality are unavoidably constrained by our experiences and the current extent and depth of our understanding.

He further realised that such understanding would always be compromised, most particularly, by what we still didn't yet know, but also, and primarily, by our own arrived-at assumptions, concepts and principles. The journey to a “full understanding” was not only never-ending, but was also strewn with passage-impeding rocks of our own making.

Now, that doesn't sound either very profound, or even optimistic. Indeed, it is often used as an argument for – “Give up now you'll never do it!”. But that wasn't Hegel's view! It may appear defeatist, but that wasn't what he took from this discovery. He recognised that our assumptions were absolutely necessary, to make any progress at all, and, crucially, they were never pure invention. On the contrary, they were always based upon some aspects or parts of an as yet unrevealed Absolute Truth. And, this content gave those conceptions a definite measure of objectivity. But, invariably, such extractions from Reality would be useless if each of them only applied to a single solitary thing. Mankind wanted more general conceptions that could be used across the board. So the correct parts and aspects were turned into “general truths”: and that was both a breakthrough, and an error!

For, the incompleteness of these forced generalities - clearly unavoidable when they were made, would also unavoidably confer a distorted outcome upon our subsequent uses of these generalities. Though they would work in many cases, they would also, and inevitably, lead to a point where they would deliver contradictory pairs of consequent concepts. These pairs were clearly mutually exclusive: they were in direct contradiction to one another, and yet were BOTH outcomes of our earlier assumptions. They couldn't both be true! Yet, neither one nor the other could be sufficient to cover what the pair delivered. They were both wrong!

Now these Dichotomous Pairs indicated to Hegel (just as the Pair Continuity and Discreteness had indicated to Zeno some 2,300 years earlier) that the underlying assumptions, in spite of containing a measure of Objective Content, were also, in fact, both at fault in important ways.

The question was, “How can we possibly transcend both these erroneous concepts, and come up with better ones that were not contradictory?”

Hegel, therefore, used this to set about finding ways to transcend these impasses that seemed insuperable if we were to keep both of the contradicting concepts. By a careful study of the members of a Dichotomous Pair, he was able to reveal the assumptions upon which they were based, and his task would be to replace them with other assumptions that could deliver the positive aspects of both, while removing the contradictions. The impasse would only be transcended and a better basis for understanding put in place, if the new suggestions dug deeper and revealed more aspects of the truth than were embodied in those they were to replace. He knew, of course, that even if successfully achieved, this would nevertheless be a never-ending oscillation. For each new premise would, in spite of the gains it had delivered, in the end, reveal its own shortcomings by producing yet another Dichotomous Pair, and with it another seemingly final impasse.

Hegel called this method Dialectics, because instead of obvious adjustments to one or the other of the Pair, the solution had to deal with both, testing what was suggested for one, as it affected the other. In the end the premise had to be as good as possible for both: the process was a dialog between the requirements to solve both the members of the Pair. At the end of the process a single new basis, which dealt effectively with both, had to be delivered, if the achievement was to be anything other than a clever frig. Clearly, such solutions would never be easy to achieve, and the underlying causes, would not only be well entrenched, but would have repercussions in many different areas. The new assumptions would be revolutionary!

Clearly, the most important feature of Dialectics was that it rejected the methods based upon Formal Logic, for they underlay massive tracts of the prevailing culture. The building of greater truths out of lesser truths, as was the basis in Formal Logic, was totally rejected. Instead of a mere accumulation of new knowledge being sufficient, it was clearly a transformation of how we thought about things that had to be achieved, And, this had to be done every single time! [As V. Gordon Childe, the great archaeologist said, “Man makes himself!”]

Hegel's contention was that the building of Truth could never be cumulative, but came in fits and starts as prior, misleading bases had to be demolished and replaced on a regular basis.

You may have heard of Dialectics as the method used by Karl Marx, and the evident basis of Marxism, which it certainly was, though, of course, Marx had transferred Hegel's methodology wholesale into a materialist perspective, and hence renamed his method Dialectical Materialism! But not many know what it actually involves?

The Inevitable & Persisting Contradictory Bases within Science

When attempting to extract from evidence in Reality, we have a tendency to seek formal principles, even when they don't really exist in the way that we conceive of them. The undoubted fact that we certainly do “see” them, though, shows that whatever is actually going on, does indeed throw up things quite close to the “perfect” forms we choose to make the significant causal factors in a momentarily noticed instant. [But as with all such “snapshots”, these extractions are bound to mislead!]. Yet, even, to be able to do this, is both very clever of us, and also, most often, extremely useful too.

The sorts of things I am referring to are “principles” or “concepts”, such as Symmetry and Asymmetry, and the even more commonly employed – Continuity and Discreteness.

Less obviously abstract are the perfect circles and squares that we discern as occurring in Reality. Yet, both these, and the “principles” are seen as “primary, formal causes”, whereas they are no such things!

These forms actually reflect momentary glimpses of a temporarily dominant situation, consisting of just some of the real physical causes that are both present and significant – indeed a momentary gelling of these into such a glimpsed form. But, the transitory natures of such appearances show two things. First, that the real situation is in essence not merely a sum of such forms at all, but a much more integrated and mutually affecting nexus of varying contributions. And secondly, involves only a subset of the full set of factors present, and certainly not the full and necessary situation, essential in enabling a proper description and explanation of an existing situation, as it occurs in Reality-as-is!

But, looking for an explanation, a glimpse is enough for us to attempt to so organise the environment of our consequent studies, so that these previous, partial and idealised forms are forced to appear much more clearly. For, when by extensive filtering and rigid controls, we achieve this, we immediately feel “proved right” – “they are indeed the natural perfect forms that are usually messed up by other “noisy” and contrasting contributions in a complex sum”. We also assume that it is only they that are “significant”! We ignore the rest! “And then we generalise – “The World is built, solely, out of such perfect forms. We have exposed and extracted the true causal factors!” But, on the contrary, such are without any doubt purely formal! No one can show you a perfect and disembodied square, or even a disembodied perfect Symmetry! They are abstract, idealised notions!

Maybe concrete things can, for a time, almost perfectly display such forms, but to then do what we do with them is certainly flawed, and for the following sound reasons:-

ONE: They cannot be separated from their concrete embodiment, and
TWO: They are idealised forms alone, and include neither entities, nor properties or even forces.

We have this way of dealing with messy confusing Reality, and we mean to show that the driving essences of everything are precisely various sums of such forms alone. We even encapsulate such forms into symbolic equations and then call them “Laws” – as if it were the forms that produce phenomena, and not phenomena that produce the forms. We switch a materialist view with an idealist one!

Now, though such methods are mistaken, their results are never just unfounded invention. They do indeed contain something profoundly applicable in our World! For such forms are the common consequences of near-perfect combinations of real physical causes. So, in recognising them, we are indeed noticing how such things can, if handled in a very special way, take us forward in attempting to understand Reality. Our abstractions are certainly useful, and can lead us to explanations. But, they are never the full truth, or as it is often called The Absolute Truth!

So, our carefully constructed and maintained experimental Domains do indeed reveal important things. Though, they are not what we think they are! To, first of all, conceive of, and then achieve, our desired results, we had to both modify, filter and then control the context to be investigated (and later used), in such ways that our targeted (previously only glimpsed) forms were clearly revealed. But, then, the significant features were the remaining concrete factors, which together, as a mutually affecting set, delivered that formal result, and NOT the formal result itself.

You can see what happened! Instead of then considering the factors, still present, and how they, together, caused the observed formal result, the investigators considered that their experiment had actually “confirmed” the causal nature of the revealed formal relation: it had caused the observed situation.

Now, these two standpoints are well known. The repeated revelation of the physical factors involved is the materialist approach, while the switch to concentrating solely upon the formal “driving” relations is the idealist approach.



And, for centuries, these two approaches have managed to co-exist – for a while even occurring within the same individual scientist, but, as development progressed, they gradually became different, cooperating specialists. Indeed, the consequent use of formal relations was then exploited by a third kind of specialist. So we gradually reached a situation in which we had Experimentalists. Theorists and Technologists, and, to add flavour from without, we cannot leave out those brilliant, committed idealists – the Mathematicians.

But, in spite of quite breathtaking cooperations between these various investigators, they were, each and every one of them, based upon very different philosophical positions. NOTE: Indeed, it was this diversity of standpoint that allowed continued developments, for the basic positions of them all were seriously flawed, and it took an unprincipled pragmatic alliance that allowed these inadequacies to be overcome, if only partially.

Yet, two important things were vital in keeping such diverse teams together. One was effective use of the equations produced. And the other contribution was that provided by the Principle of Plurality (more or less agreed to by all the various disciplines involved). For, these underpinned the cooperation, and brought together all of their different skills and methods, in a pick-and-mix pragmatic way, that proved invaluable in making what could be called “Technological Progress”! Yet, even so, such a compromise could not last!

So, contradictions or not, Man had little choice in how Reality was to be addressed. He was, and for a very long time had been, existing in a World, where his intelligence was his greatest asset, and quite naturally he used it to survive, without having to understand why he managed to do so! But, also unavoidably, he thought about the World he lived in, but could, even there, only make use of what Natural Selection and experience had endowed him with – a truly brilliant pragmatism! Even his greatest achievements were not necessarily understood, but merely known from experience or use.

So, these abilities and knowledge were his basic equipment, even when he began to think more deeply about his World: for how could you affect things you didn’t understand, in the ways you wanted them to go? If you could not see a way to do it, could not some particularly brilliant Leader, or even a God - “on our side”, be the ones to turn to? Both of these were tried at length for millennia, but slowly Man had to attempt to extract more from his experiences: he had somehow to begin to understand them!

And, even then, that long history and endowment could not but affect how he initially addressed such a problem. So, it was his past pragmatic successes with others that powered the development of his practice and conclusions. The coming together of different approaches, which

together had succeeded was both natural and fruitful as his future approach. Initially, in these cooperations there was no contention due to opposing stances – only pragmatic resonances and effective uses are what made diverse approaches work together.

But, in addition, as thinking progressed, Man had to have a guiding principle, that would not only prove the possibility of progress, but could also gel with these diverse practices – whatever they were!

The result was a universally agreed Principle of Plurality, which assumed that complex, messy Reality was, at base, caused by the summation of wholly separate causes. They did not affect one another as such, but added together unchanged, in diverse sums – varying only in the quantities of each contribution. These causes were Eternal Laws, and were represented by the Equations extracted from Reality. So, all the different specialisms that had arisen within Science (including the mathematicians) could energetically subscribe to this Principle as the common foundation of all their very different practices, and Philosophies.

How very pragmatic of us! And, even more importantly, it allowed that cornerstone of all their positions – Analysis to be pursued, and therefore gave fitting-together methodology for investigating Reality, with all seeking these separable, formal causes as the driving Natural Laws.

Abstractions & Emergence

Stability & Revolution

The initial significant contribution by this researcher entitled *The Processes and Productions of Abstraction*, though an important first step, only addressed one aspect of Abstraction, which could, and indeed did, historically, lead Mankind astray.

The significant discovery was, perhaps predictably, the establishment of a category of Abstractions about Abstraction, or Ideality, which is the realm of Pure Mathematics, or more descriptively – The World of Pure Form alone, that involved both the gains and the errors in that area. It was important, but it did not address the most important weakness of all Abstractions – that they both simplify and even idealise features of concrete Reality in a pluralist way – indeed, as Natural, Eternal and entirely separable Laws. And this, unavoidably, restricted these processes and their consequent productions to a Stable Context. They applied only within Stabilities!

Now, of course, such stabilities are all around us, and particularly long lasting, so that they appear in the relatively short periods available to human beings as Permanent. And, with the possibility of quite conceivable and constructible constraints, and their extended maintenance, resultant Stable Domains could be achieved, and within them a situation quite close to stability was possible, and reproducible laws, their use in predictions and production could be guaranteed.

Indeed, pragmatically, for Mankind, as it had so far developed, it was the only way to go, and of course, enabled the vast range of productions which now dominate our modern World.

But, with such a stance and consequent methodology, Mankind could never track the trajectories of significant Qualitative Change – of Development, which cause the vital evolution of Reality, and all its creations. Such investigations were impossible with a part of Reality held as still as possible to reveal its inter-relationships only within Stability.

Think what such an approach inevitably excludes! For without any supernatural interventions, Reality in Dynamic Change has indeed evolved, and in doing so delivered Life, Consciousness, Societies and their consequent Cultures. And the producing great revolutions occurred naturally, though they were not always observable!

Of course, we had to learn to walk before we could run, and those first essential steps involved abstractions from a presumed-to-be-unchanging World! The first steps

had to include such necessary simplification, and from by no means pristine results of appropriately farmed investigations, we also idealised them into “perfect forms” too. We held-things-still to begin our investigations, and looked for, and found ideal patterns therein. We were not yet equipped to do anything else, and though changes were certainly noticed, the reasons for them were sometimes “out of this world”!

In a sense the *Processes and Productions of Abstraction* are grounded in Formal Logic, and hence in a conceived of System of Eternal Natural Laws! So, the question arises, “How do we extend this system to include these vital areas of Development and indeed Creation? Believe it or not, these objectives have been tackled, though no universally applicable System is, as yet, in place.

The heroes of this trend have to be the philosophers Frederick Hegel and Karl Marx, and scientists such as Charles Darwin with his remarkable Origin of Species. But, the mainstream in Science, and most damagingly in Physics, is still on the old track, in spite of its many crashes, somersaults and reversals! Their “model railway” does not yet go to areas that must be covered. It is a fascinating and rich World, built into an attic Domain of Reality, but ignoring the real, changing World carrying on outside its walls.

It allows a fascinating hobby, with its own rules and patterns, and Control, but in leaving out real developmental changes, it never addresses the crucial features of that Reality, with its propensity to change and indeed Evolve! It is still a localised study of the easy, controllable stuff! And, of course, taken to the limit, it invariably unearths more and more contradictory concepts and principles, which it cannot transcend! Primarily, of course, it is also pluralistic, rather than holistic, and hence hold still, or even, remove just those features that are involved in real qualitative Development. Hegel was able to show the consequences of that approach, and even suggested a method of possibly transcending such contradictions. But, the task was, and still is, much more general than his Thinking about Thought: it is about literally Everything in Reality, and an idealist standpoint cannot handle that! A Holistic approach to Science must be devised and constructed and that has yet to be done! It involves the Study of Emergences, or as Marx did it, the Study of Social Revolution!

NOTE: This task has begun! Of course, Marx’s main area was of applications in social development, and it was mostly in that area that his discoveries were made. But, the unfinished task, for over a century, has been to broaden the

gains of Hegel, Darwin and Marx into Science in general, and this has been slow to develop, but has finally begun. This researcher (Jim Schofield) has already written upon Truly Natural Selection (about selection applied to the non-living World), *The Theory of Emergences*, *The Theory of the Double Slit Experiments*, and many criticisms of the currently still dominant Copenhagen Interpretation of Quantum Theory in Sub Atomic Physics, as well as many contributions to both Philosophy and Cosmology. [See SHAPE Journal, Blog and Youtube Channel on the web]

