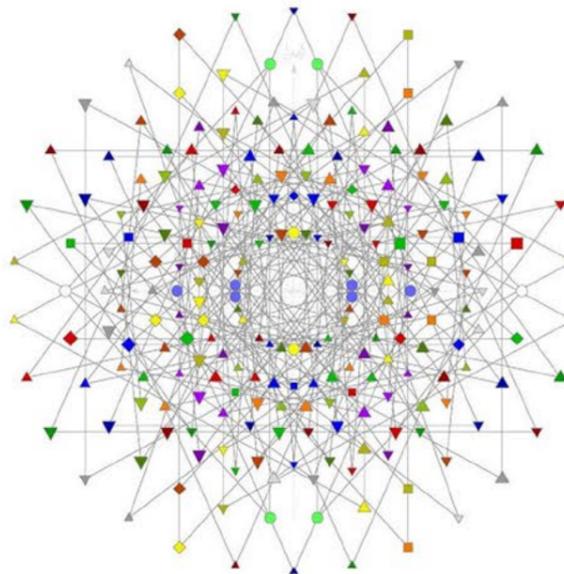
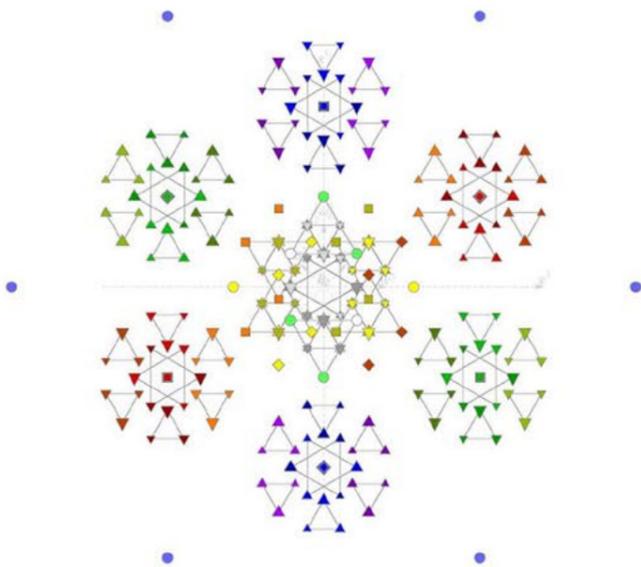
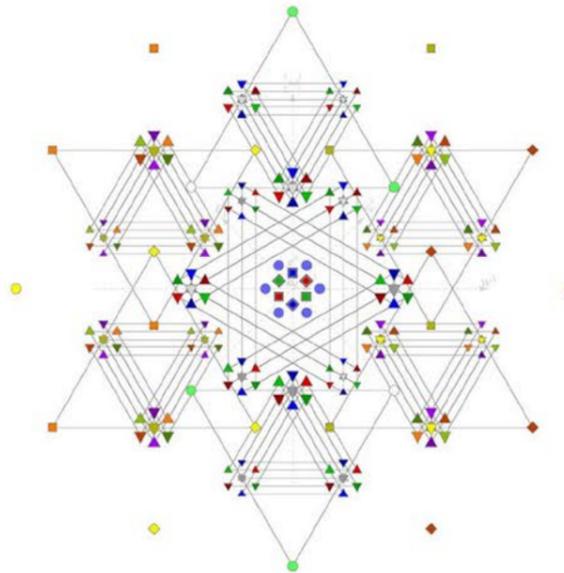
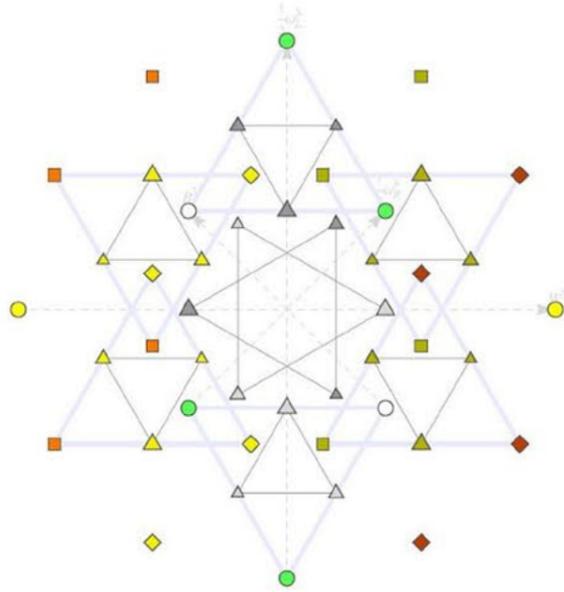




SHAPE JOURNAL

MYTHS OF TEGMARK

THE MEANDERING PATH TO TRUTH / THE WORSHIP OF FORM /
THE GROUND OF SCIENCE / TEGMARK'S 'INDISPUTABLE' LOGIC /



**Shape Journal
Issue 34**

**Myths Of Tegmark:
Critique of Our Mathematical Universe**

1. An Introduction to the Ground of Science
2. The Meandering Path to Truth
3. The Worship of Form
4. Tegmark's "Indisputable Logic"
5. Glorious Form & Irrelevant Baggage

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Demolishing the Myths of Tegmark

An Introduction to the Ground of Science



Welcome to Issue 34 of the **SHAPE Journal**.

This edition is primarily a response to Max Tegmark's work as revealed in *New Scientist* (2012), but to deliver a meaningful critique, we must first clear up a few important questions.

Now, as is becoming clear, there are already many different responses to Max Tegmark's various recent articles and publications (including his recent book *Our Mathematical Universe*), but though he represents an extreme position in modern science, his basic conceptions are not only adhered to by the majority of his colleagues, in his, and in related areas of study, but also that such a standpoint is fundamental to their own positions too.

So their entirely-within-house criticisms are way short of what is required here. For, as they either partially, or even wholly, subscribe to his fundamental bases, they simply cannot demolish his ground, as they too are standing squarely upon it!

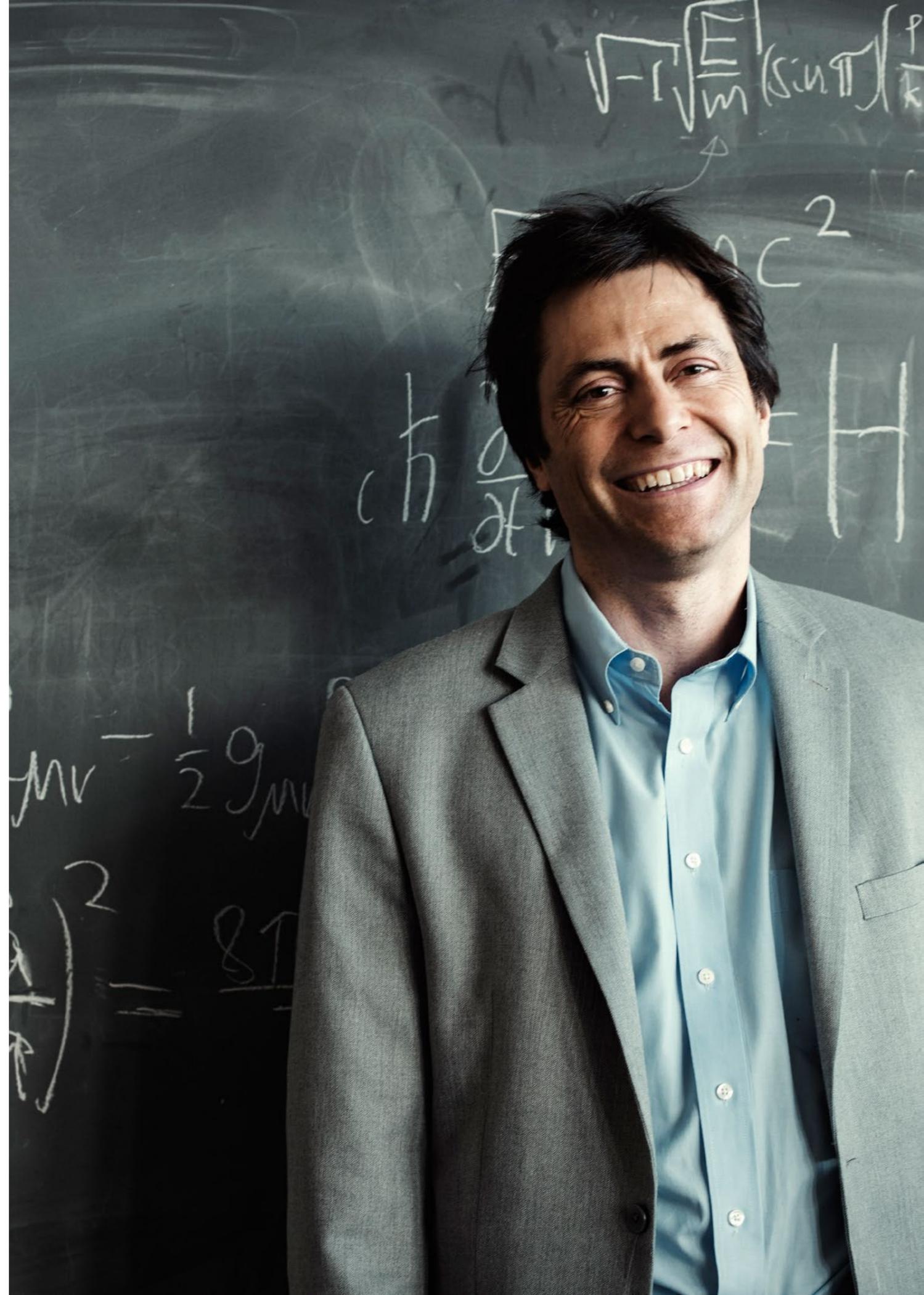
Two sets of papers are therefore proffered by this more thoroughgoing critic.

The first set addresses Tegmark's contributions, while the second set is a direct critique of the basic assumptions that he makes. These are made from a position, which is both materialist and holistic, whereas the tendency containing both Tegmark and the vast majority of his colleagues in Sub Atomic Physics are both idealist and pluralistic.

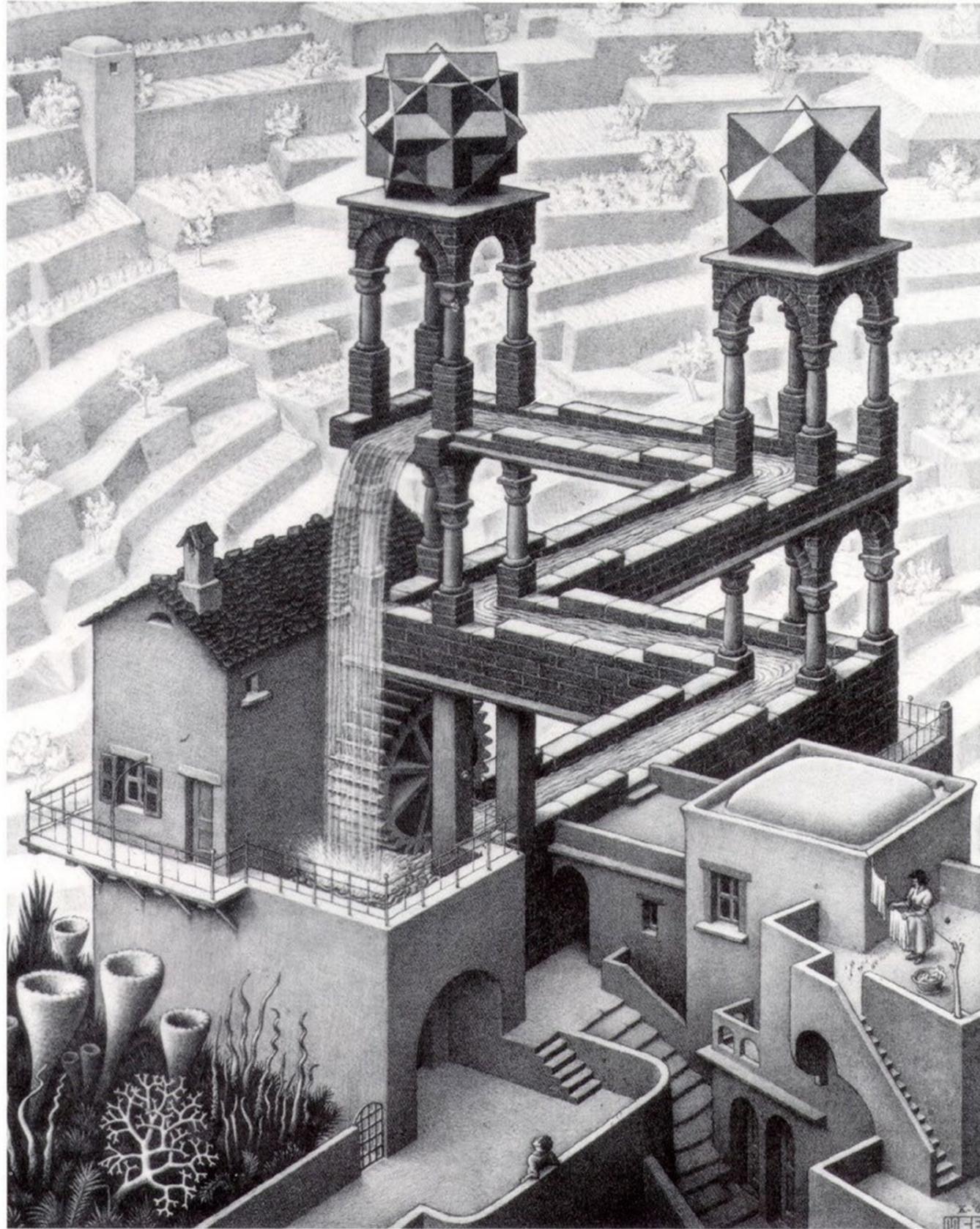
P.S. Subsequent to the writing of these Specials, Tegmark has produced yet another rocket, in which he insisted that Consciousness is merely yet another Phase of Matter, along with Solid, Liquid and Gas.

So clearly, more will follow to debunk such nonsense in the near future.

Jim Schofield Jun 2014



The Meandering Path to Truth



TWON

Let us begin by addressing the difficulties of revealing, via devised concepts, the true Nature of Reality.

It is abundantly clear that our World is not only complex, but also hierarchical in its nature, so that, having identified some particular feature, we are bound to investigate it and reveal, in turn, its determinators.

The process soon appears to be infinite, especially when we are dealing with the most developed areas of Reality, such as Life! And in attempting to address such an infinite sequence of producing layers, Mankind just had to equip itself with “available and appropriate” tools of thinking, and, perhaps even more important, also involving methods, and even techniques, devised in order to make any such investigation at all feasible.

We must never forget that Mankind, itself, is an inseparable part, and indeed, product of the very thing that is being investigated, so that, objectively, it seems almost impossible that such an intelligent and self-reflective part of Reality, such as ourselves, could ever have evolved from that same Matter that delivers everything else, at every conceivable level.

What is certain, however, is that in spite of the “miracle” of Man’s emergence, he could not be naturally equipped with what he would undoubtedly need to take on the task of delving ever deeper into the true nature of Reality.

It was just a few thousand years ago that Mankind was making its only adapted tools out of pieces of natural flint stone. How could he be appropriately equipped to study the underlying causality of all he surveys, and, even more so, of all he is able to reveal.

He couldn’t be so equipped, of course! For his initial gains were only similar to those of the higher animals, but writ ever larger!

Yet, he was the possessor of the most developed brain that, it turned out, just had to be his main tool. For he had no big teeth or powerful limbs and claws, or any of the usual features selected for by Evolution and environment. But with a brain developed due to his bipedal gait and consequent release of the arms and hands for other more dextrous purposes, there was always the usual potential in evolution of certain abilities being re-employed in other areas. And, these pushed Man’s evolution along very different paths to the norm, and centred the main developments into the brain. Mankind was to survive by a wider use of this developed intelligence. It meant that just as he had been forced to make his own tools out of flint, he would also have to make better concepts and thinking techniques about his World by using his Brain in

revolutionary new ways. He would have to create his own cerebral tools to begin to tackle the meanings of things.

Thus, a basically weak and un-armoured creature had to nevertheless be able to succeed against much better physically endowed prey and predator animals by thinking out other solutions. And, that enabled this fairly weak animal to nevertheless be able to get what was needed to survive, and simultaneously spread right across the whole of the accessible World.

Indeed, these endowments had turned into other significant possibilities, and, in the Neolithic Revolution, Mankind finally also released itself from its early, constantly wandering Hunter/Gatherer existence, to one where groups could remain in one place, and so begin to control small areas of the Earth, where they could now adequately grow crops and husband animals enough to not only survive, but also actually prosper.

And gradually, they emerged as a very different kind of animal. For the new mode of existence could support many more individuals in a given area, so that communications with others were vastly increased, leading to the tremendous development in their spoken languages, while instead of relying on the purely oral tradition of Story-Telling, they even began to formulate symbols to commit speech to paper and stone – they invented Writing!

Clearly, such developments transformed what could be retained and passed on, over extended periods, and in consequence a new Human Culture began to be built, which began to ask questions that had never been addressed previously anywhere in the whole Universe.

Nevertheless, that still didn’t make Mankind sufficiently equipped to handle the Nature of Reality. They still had to make some important simplifications to what actually was happening, to have any chance of making any sort of sense of it at all.

Now, as even lower animals are able to demonstrate, their behaviours can evolve that are effective, even if the reasons why they are so are still totally unknown.

Natural Selection is not an intelligent arbiter of what should survive, but only one that awards success via survival and the effective passing on of features and abilities to offspring or seed. So, though such pragmatic reasons selected for Man’s abilities, they also potentially widened their uses, and in an initially pragmatic way Man began to apply them to question “Why?”, which had nothing directly to do with survival.

He began to strive to make sense of his World rather than be wholly subject to it!

Now this introductory account, I must admit, is very sketchy, but it has been necessary, for it is vital to reveal the trajectory of Man's efforts to achieve a measure of understanding of the World he lived within, warts and all!

It has. Most certainly, not been easy! And the stamp of all the usual processes could not be avoided. Indeed surprisingly, some misconceptions turned out to be efficacious (for a time at least) to certain groups of human beings. For example, Religion was an amazingly unifying force in some civilisations, and contributed, significantly, to their success.

Yet, there never was a God, but the embodiment of the "best" in this invention was made in Man's own image, and it certainly proved to be a builder of confidence, cooperation and even energy in groups, who were also better equipped than potential competitors for the same resources, in many other more predictable ways, in addition to the belief that effectively substituted for the knowledge they had not yet been able to accrue, and gave them a confidence to prevail.

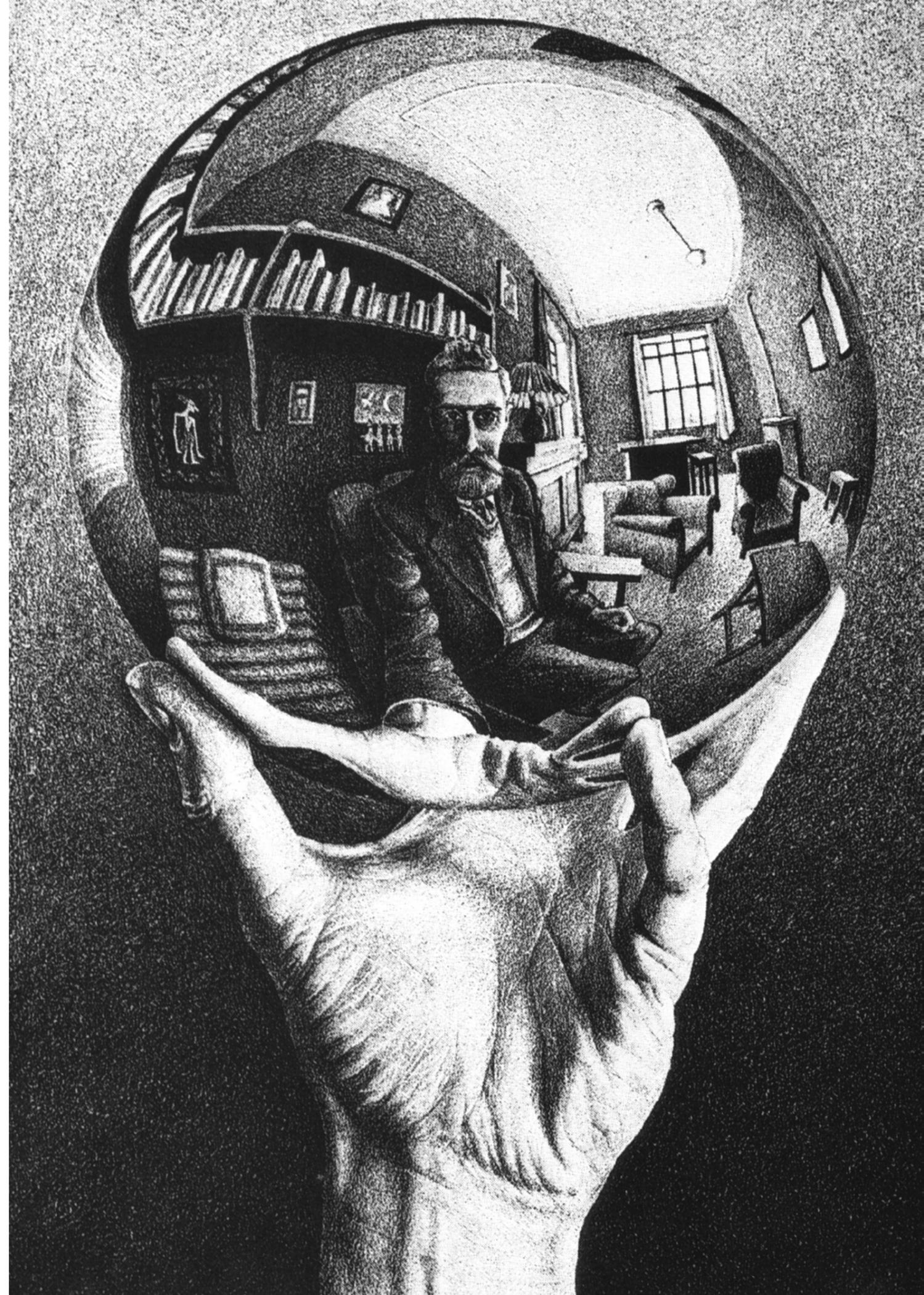
So, when it came to making sense of Reality itself, we shouldn't be surprised that what they initially extracted from Reality was not necessarily The Truth: it was most likely to be that which they could use effectively, and with confidence. I always use the example of the earliest skills in metallurgy, which were invariably laced through with rituals, incantations and even "holy additives" to make them work!

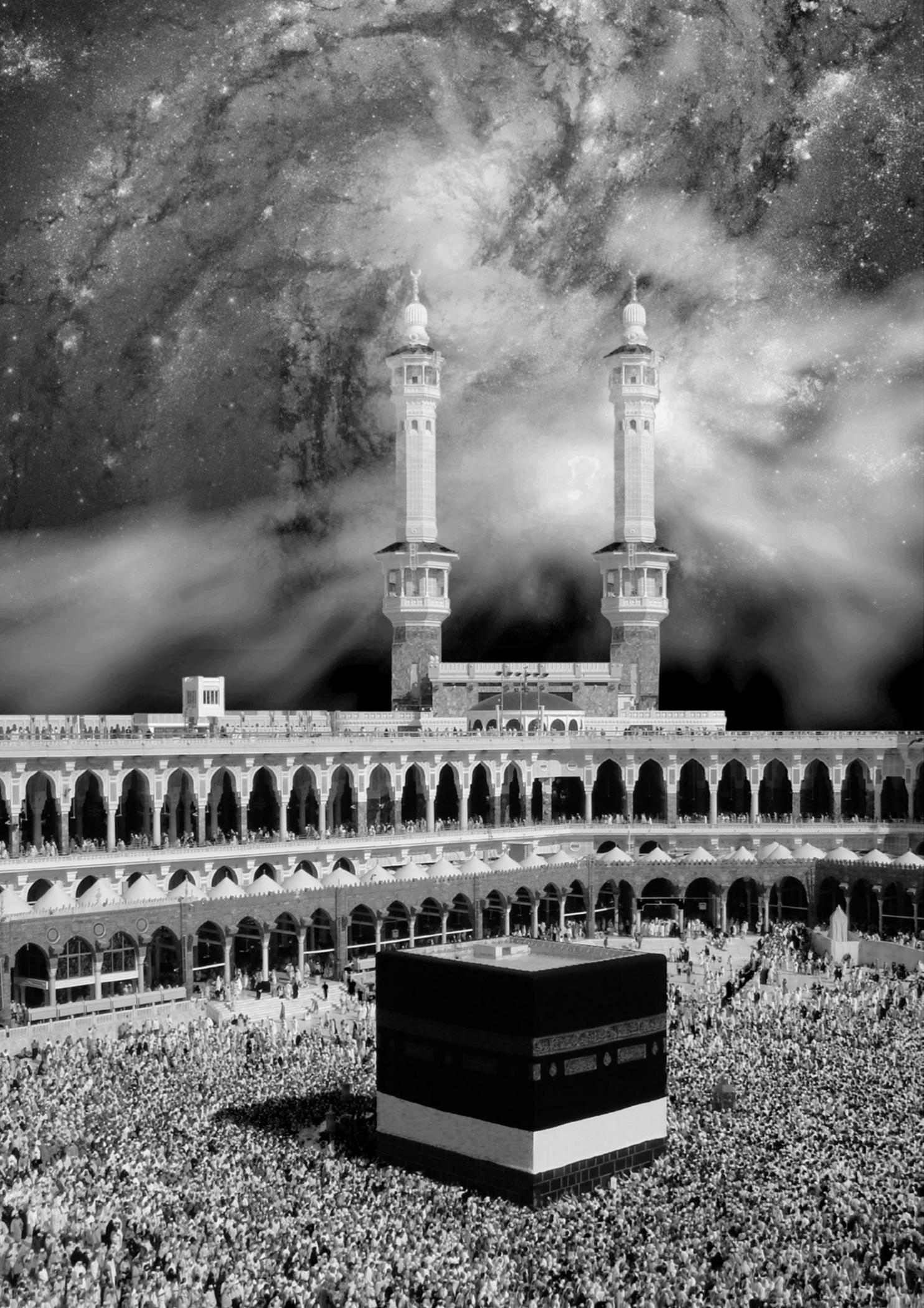
No real causality was involved in many of these performances, but there was enough in them of the right components, and in the right order, and with the correct skills to ensure success.

And, so it was with conceptions about Reality generally!

Indeed, the most important principle that was defined and is still in use to this day, was that of Plurality. For it was this assumed principle that allowed them to extensively modify natural circumstances in order to extract components and relations without by so doing changing them.

As we shall see, such temporary methods and conclusions could not but be flawed. For, they were inventions in a wholly new direction.





The Worship of Form

Having read the article about Max Tegmark's new book *Our Mathematical Universe*, my dire predictions for the unavoidable future of the current dominant tendency in Science have been sadly confirmed.

For, he discounts the whole of explanatory Physics as "mere baggage", and endows what Forms are currently dealt with by the vast majority of current sub atomic physicists as the only True Essences of Reality.

What is more, it is these admittedly abstract Forms that are the drivers of Everything (he "subtly" puts it that they also constitute Everything, but that doesn't help either).

He has finally gone the whole hog to Idealism!

Materialism, as the usual basis for Science, is just another type of "baggage": that is it is consequence rather than a cause. And the Universe acts solely in accordance with purely formal relations – as extracted and investigated by mathematical physicists.

Such an amazing standpoint has somehow to be established, so he stresses the various alternative explanatory physical theories as non-essential baggage, merely mistakenly added to the revealed, formal essentials. He doesn't say it as such, but what he infers is that all such "baggage" consists of man-made inventions, while what mathematical relations deliver are aspects of Absolute Truth.

I have to admit that I want to take every word that this man utters, and force it back down his throat with some real Reality-based Philosophy, but to go to such lengths gives altogether too much credence to what he has to say. But, he has finally admitted what the majority of present day Sub Atomic Physicists believe, which will, inevitably, deliver its demise.

Interestingly, he puts it very differently. He says that anything less than a complete subscription to Form alone, will certainly cause the end of Physics. But, of course, he is confusing what he, and his mathematical colleagues do, with the Science of Physics – the scientific effort to understand Reality. What the consensus (including Tegmark) do is Mathematics – the detailed study, NOT of Reality, but of its universal shapes and patterns that can be both extracted and then idealised from Reality, and into a World of Pure Forms alone, which we term Ideality.

Now, of course, this Sub World of Form alone is not an invention. It does exist, but nowhere as such in Reality. For each and every relation is idealised into a Pure Form as it would exist, if and only if, it could stand entirely alone – without any other relations or even any concrete Reality: it

is the World of Purely Formal Abstractions!

Now, of course, such a sub World of Form, and nothing else, is not some totally arbitrary invention. It does, indeed, exist, but as a very limited reflection of Reality, like the shapes of the shadows it casts. Mathematicians study these in preference to Reality itself, because it is much easier, and seems to directly deliver Absolute Truth - which is impossible when studying an actively changing, indeed an evolving, concrete Reality.

The simplest analogy that I can give is that it is like a study of the shadows cast by real objects: for they are determined by the real objects, but do not in any way contain the substance and active relations of that Reality, but only derived and content-less Forms of it. Hence, they will reveal relations, but only as disembodied and idealised Forms!

Clearly, as such, they cannot be either arbitrary or invented, but they have stripped out completely what actually casts that shadow leaving only a very limited set of formal features of the severely limited views and their rules.

Now, though by no means exact, this analogy can also address the surfaces on which the shadows fall, from purely flat planes to all sorts of other topologies – delivering very distorted, yet expressible, shapes that occur upon them. So, in that sense, Mathematics is incomparably less than Reality, while also extendable beyond its concrete source in all its possible distortions.

To the man in the street, unaware of modern Sub Atomic Physics, what Tegmark expresses is either totally unintelligible, or alternatively "beyond his ken" - magical truths revealed by the only true experts in studying Reality at that level.

Yet, the first conception was the right one. Such people as Max Tegmark are what are termed mathematical-theorists of Physics. They deal wholly and only in mathematical forms, as the true essences of Reality. And, in that they are totally wrong!

The question is, "How do they get away with it?" And, "Why are they not trounced by other physicists occupying themselves with concrete Reality itself?"

Well, the reason is that the opposing group (what is now left of them) were, and still are, also incredibly compromised in their own basic standpoint and approach.

For centuries they have all based their studies and experiments on the fundamental Principle of Plurality, and this has led them into a complete dead end in attempting to continue ever deeper into revealing the true Nature of Reality.

For, Plurality enables their banker technique, which they call Analysis. Via Plurality, it is assumed that numbers of eternal Natural Laws act together upon each and every situation in Reality, but only sum in various ways, with different dominances that deliver very different resultant scenarios. Their only approach is to tease out what they assume to be these “entirely separable” laws, in order to explain what they have observed.

Experiments are purposely constructed with the objective of clearly revealing a particular “law”, so that it can then be extracted. Multiple reapplications of such methods can be arranged to reveal each and every acting law in a given situation, and once they are all known (or, at least, the most important ones in the given context), they can be summed with different weightings to explain the overall unfettered Reality that has been directly observed. BUT, Plurality is the Principle that insists that these laws are wholly separable, and that such methods are therefore entirely valid. But, it just isn't true!

The World is certainly NOT pluralistic, but, on the contrary, it is Holistic! The laws extracted by these methods are NOT eternal, but actually caused in each situation by many different factors, which mutually modify each other and deliver what we actually see. The assumption of entirely separable laws is a man-made construct!

ONLY, in appropriately constrained conditions can such ideas and methods be made to work, but absolutely NEVER in totally unfettered Reality! Plurality is a man-devised strategy to make of Reality what enables investigations to deliver such “laws”, and thereafter to use them to both predict and produce as long as the conducive, restrictive and filtering conditions are maintained throughout! Such “laws” are limited to the conditions in which they were extracted. Outside of that context, they are different, and will fail!

Now, this development, historically, was entirely unavoidable! For, in spite of Holism being much closer to the real nature of Reality, it could NOT suggest any means of investigating what was going on.

NOTE: Buddhists would disagree, but their whole philosophy is mankind-based, and is about the “perfection of the individual” in their personally realising Reality in all its simultaneity.

The pragmatic purposes in bending parts of Reality to both analysis and useful tasks, was much better served by control and maintenance of Parts of Reality assumed

by Plurality, and implemented by extensive “farming” of contexts. Indeed the whole of Science is generally pluralistic!

In addition to this important flaw in conceptions and consequent methods, this meant that all Theories were also unavoidably flawed too. The pluralistic methods did indeed reveal very clearly entirely extractable and also useable formal relations, BUT ONLY in the simplified set-ups that had always to be both constructed for extraction, and also maintained for effective use. And unsurprisingly such intended idealisations meant that the very same Pure Forms were found in many different situations.

Such idealised Forms were indeed universal, in such carefully perfected and producing contexts.

Yet, this was damagingly turned into a belief that the Forms were the motive forces of Reality: they all over the place, made phenomena act as they did. The preoccupation with Ideal Forms, automatically endowed them with causality, and hence turned believers into Idealists rather than Materialists.

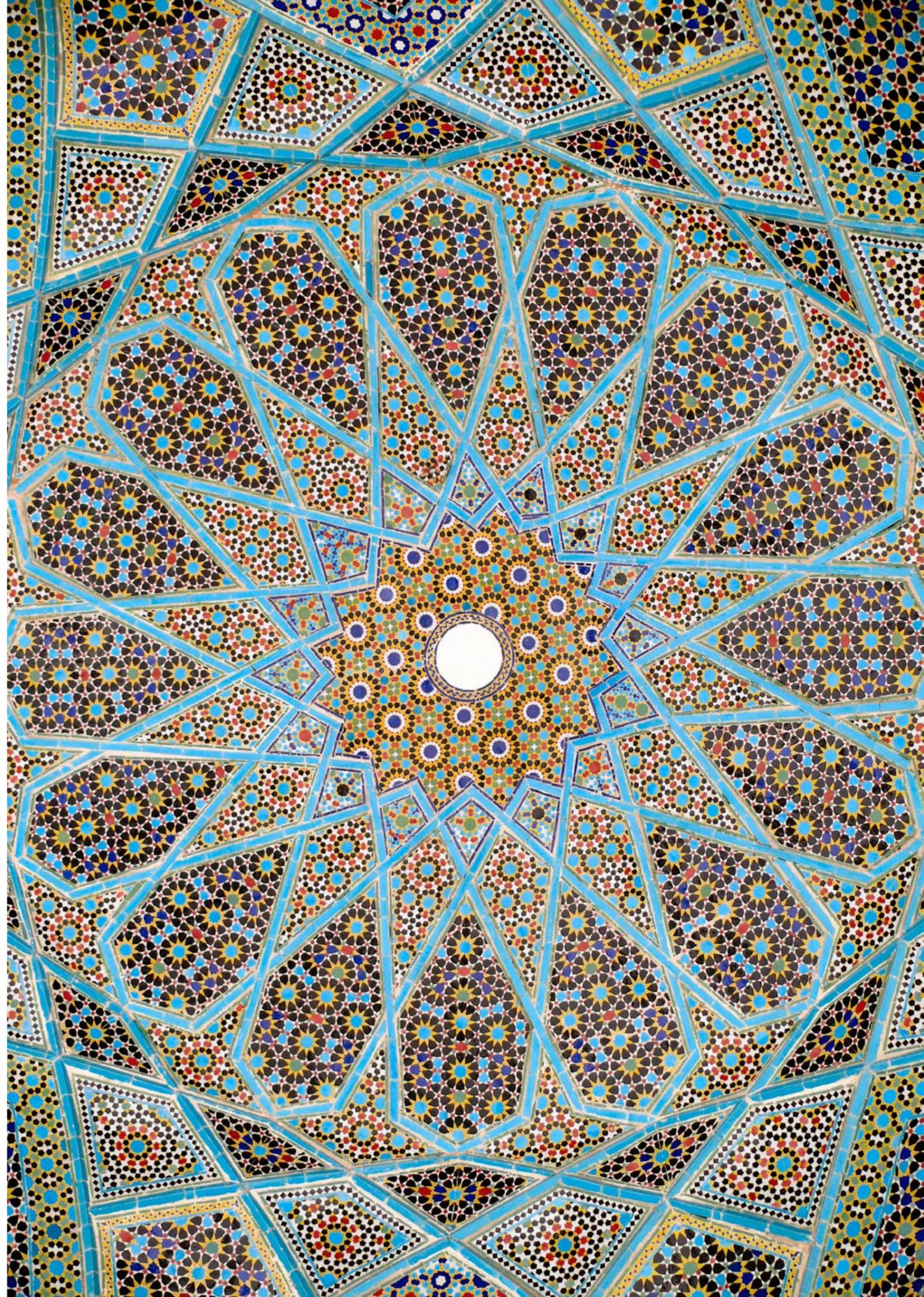
As Hegel had clearly demonstrated, incorrect assumptions would always lead to the establishment of a Dichotomous Pair of mutually contradictory conceptions, which had to be switched between as and when each delivered what was needed.

Science had long been afflicted with such an impasse, but pragmatically soldiered on; un-phased by their contradictory based Sciences, and even Physics became an amalgam of separate specialisms with different philosophies – Experimenters, Theorists and Technologists!

Now, Mankind, being what it is, these approaches were speculatively extended with a view to explaining the World. And together they gave both an explicable view, as well as a pragmatic useable Form. But, while one, the explanatory View, could never deliver the “Absolute Truth” of Reality, the other, the mathematical one, could indeed deliver the Absolute Truths of Pure Form! You can see the unavoidable problem!

Now, re-reading the whole of the article on Tegmark again, you cannot but be struck by how static is the World he describes. And such a stationary World is also not true! You would think he is saying that he is attempting to reveal the eternal laws, which supposedly add together to make Reality what it is (as strictly pluralistic as that of his opponents), so, nowhere do you get any kind of inkling of the Development of Reality, and, most importantly, its undoubted creations of the wholly new.

He might disagree, but frankly such things are so important that to not even mention them means undisputedly that he doesn't consider them as significant. I can only assume



that he is a supporter of the “ever more complex mixes” attitude, wherein all the acting laws are totally constant, but come together occasionally in new quantitative mixes, and thus deliver what seems to be wholly new, but is actually just a re-arrangement.

This would make Life – merely a re-arrangement, and Consciousness – yet another!

NO!

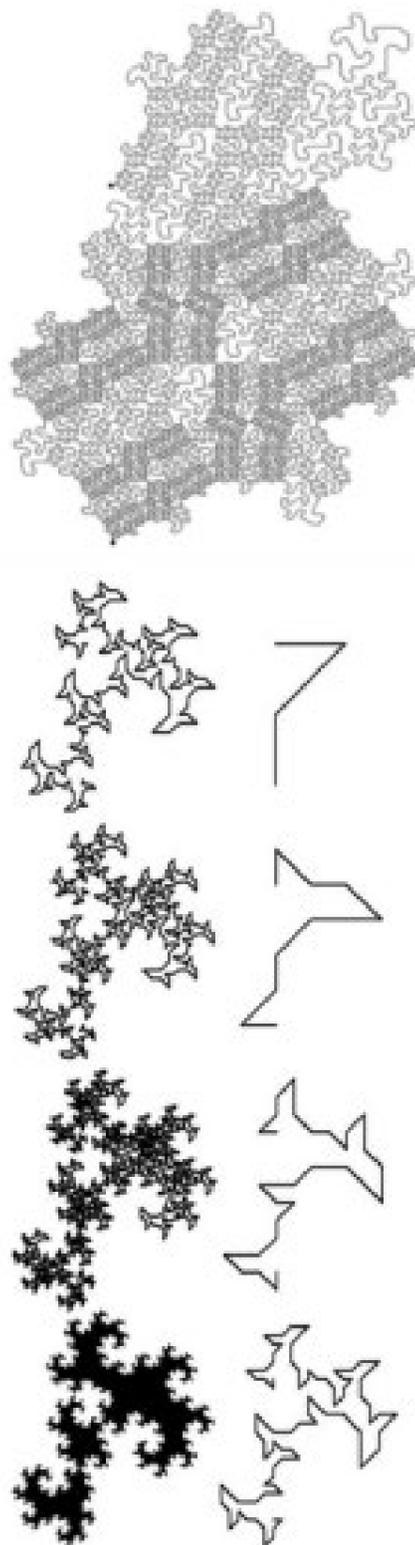
Emphatically, Tegmark is not only a mathematician, but also a pluralist, and a rejecter of what are usually termed Emergences - or short episodes involving creations of the really wholly New!

To miss out this absolutely crucial aspect of a Developing Reality, also condemns his standpoint completely, and makes his philosophy a study of Stability only!

Nowhere does he include interludes of crisis, collapse and emergence. To him, presumably, his elementary particles have just come together in a particular way, in, say, the human brain, and when he and his fellow physicists have all the fundamental laws within their hands, they will have no real difficulty, not only in explaining Consciousness, but also in being able to construct it on the then very latest computers.

May I say it?

It is a very stupid philosophical or scientific standpoint!



Tegmark’s “Indisputable Logic”

Tegmark has a favourite argument!

He says that, on the one hand, there is an approach that believes there is an external Reality, existing totally independently of Human Beings. And, on the other hand, there is one that says Reality is wholly mathematical, in its essential and determining relations.

He asserts that these are usually posed as mutually exclusive alternatives, but in contrast he “proves” that the first somehow “inexorably implies” the second. Of course, he is mistaken!

And, the reasons for his erroneous “logic” is that he is never conscious, never mind explicit, about his own assumptions. Eclectic scientists are particularly poor when it comes to argument: there are altogether too much un-established, and certainly un-admitted, beliefs involved in the way they marshal the elements of their World.

So, before we address his unreasonable Logic, let us remove some, at least, of his mistakes. First, no one now separates Humanity from Reality. It is clearly a part, indeed a natural development of that Reality, even though a very unusual part, for it is certainly not eternal!

It developed over billions of years and millions of layers of creative development, until that “part” is now involved in attempting to understand that Reality, and its remarkable trajectory of Qualitative Changes.

Now this remarkable embodiment of that process, Mankind, is not a God, so all attempts to do this will unavoidably be largely, if not entirely, unsuccessful. For Man doesn’t just need to look to understand, he must take in many different angle views, step forward and touch, and even devise and carry out many experiments to even have enough to make the most elementary of conclusions about any area of Reality. And, for vast amounts of time these conclusions will be unavoidably mistaken. At the very best he may gradually reveal something of what he observes – some partial measure of what it is. And, we call this achievement the currently known Objective Content of what we are considering. And while this is some sort of progress, it is NEVER the Absolute Truth, and indeed, never will be!

So, Tegmark’s first alternative is one he just dreamed up! It certainly isn’t his. Next, he goes to the opposite extreme, and has Reality as being purely mathematical.

This implies that all mathematical extractions are parts of Reality, and hence bits of The Truth. Presumably, to go on to assuming A Mathematical Universe from this, he must

mean that his found extractions are actually absolute. They will not be significantly and qualitatively transformed into something else by other yet to be revealed extra factors. He is a pluralist, though he clearly has no idea what that means!

Now, he brings in the coup de grace by talking about the sought-for Theory of Everything, by saying that if such a Theory is possible, then even if you subscribe to position one, you are inevitably pushed into position two. Nevertheless, his Mathematical Universe is inevitable. Rubbish!

Who considers that a Theory of Everything exists? Only the mathematical physicists such as himself! There is absolutely nothing in physical Reality to suggest such a thing! The idea of such a Theory is entirely based upon a conception of Reality, which is composed of formal and eternal laws, and, crucially, the many weaknesses of Plurality. His reasoning is non-existent!

NOTE: Rather than some sort of build up from basic premises, via rules of logic (or mathematics) to cover everything, in a strictly logical way, Tegmark’s idea of reasoning, is to take the banker beliefs of himself and his colleagues, without any proofs whatsoever, and present it as a “coherent overall argument”.

It is almost as if, the fact that a majority of his colleagues subscribe to this thin gruel is supposed to make it a sufficient standpoint. It is somewhat like Euclidian Geometry, in that without any physical properties whatsoever, and containing only idealised definitions, the whole of concrete Reality can be generated. It just isn’t true! Taking a purely formal World, and ascribing certain parts of it to supposed physical entities proves nothing, when supposedly delivering a system encompassing everything.

Now, let us reveal what he and his co-thinkers do, and why they believe what they do. They have actually abandoned physical explanation, and now deal solely in Form alone! But Forms are merely the patterns or shapes that occur within stable arrangements in real situations. But generally, such are only rarely completely evident. To display them clearly, the content of a situation has to be isolated, and then transformed by eliminations, or rigid controls of as many elements as possible, designed to reveal a single relation or pattern.

Once revealed, a series of measurements, over a range of values of a given variable, can be made to deliver values for another, and it is then possible to present this relation entirely as an equation of the two variables involved.

It is a purely formal description! And the only features involved are quantitative patterns. How on Earth can such content-less figures be the cause of what exists. It is surely merely a formal description of a pattern, and nowhere near an explanation.

The farmed situation that delivered this data has been rigidly modified, and then maintained, in such a way that a simple relation is exposed, which can be used to predict and even applied to some required outcome, but how can it be said to include all that is important in the situation? It leaves so much out of the operation that is only about Form, in its own terms, and absolutely nothing else.

Clearly, when looked at in this way, it quite rightly doesn't seem very profound – because it isn't! But, making any change to a required value by arranging for it to have another value seems remarkably restricted in its meaning and its use. And, if the same sort of processes are repeated for each and every major factor in a situation, a whole set of equations can be extracted –each with its necessary Domain of Application. And, if each is used in turn in its appropriately tailored Domain, a series of these can be arranged to deliver a final planned outcome.

The usual physical facility that allows this is, of course, the factory, though in a modern society there could be a whole string of such factories situated in different places or even different countries. Clearly, even with these extremely restricted methods manufacture can be organised to finally deliver a saleable item for the World market.

This demonstrates the pragmatic power of Form! Yet the very same Form can occur in many, many entirely unrelated situations, so, for certain, we cannot place that Form as the actual cause of all those situations. It is, after all, merely a common pattern, and NOT a common cause!

The actual causes involved can be extremely varied in these many situations, and it is these, usually called the producing Content, which actually cause what occurs. The Form is only a pattern – like a common cast shadow from many quite different entities – the casting of a shadow loses all content, and only delivers a content-less pattern.

So, emphatically, the Form can never be the cause of a phenomenon, but only its formal and resultant shape. It is the Form that is caused.

We have a classical many-to-one relation in Reality. While our Worshippers of Form insist that what is really happening is a one-to-many relation delivered by the Form alone! Their “one” is a “causing Form”, whereas in concrete Reality the “one” is the particular caused Form, produced by many different, physical causes.

Now, in the History of Mankind, the first real intellectual gain in such considerations was indeed the recognition of idealised Form.

It was essential that we recognised the edible from the dangerous, and the useful from the unreliable. Form was the means by which this was achieved – we had little else to go on at that time! We also began to identify some of the interesting relationships between different Forms, or even between different instances of the same Forms.

I have to insist on the word “idealised”, because they could not do anything profound until they “cleaned up” considerably the Forms they recognised.

The magnificent pinnacle of such processes was, of course, the Euclidian Geometry of the Ancient Greeks, in which circles were perfectly round, lines were of zero thickness, and of potentially infinite length. Planes had to be perfectly flat, and similarly potentially infinite, and all dots were of zero extension, and defined only by their positions.

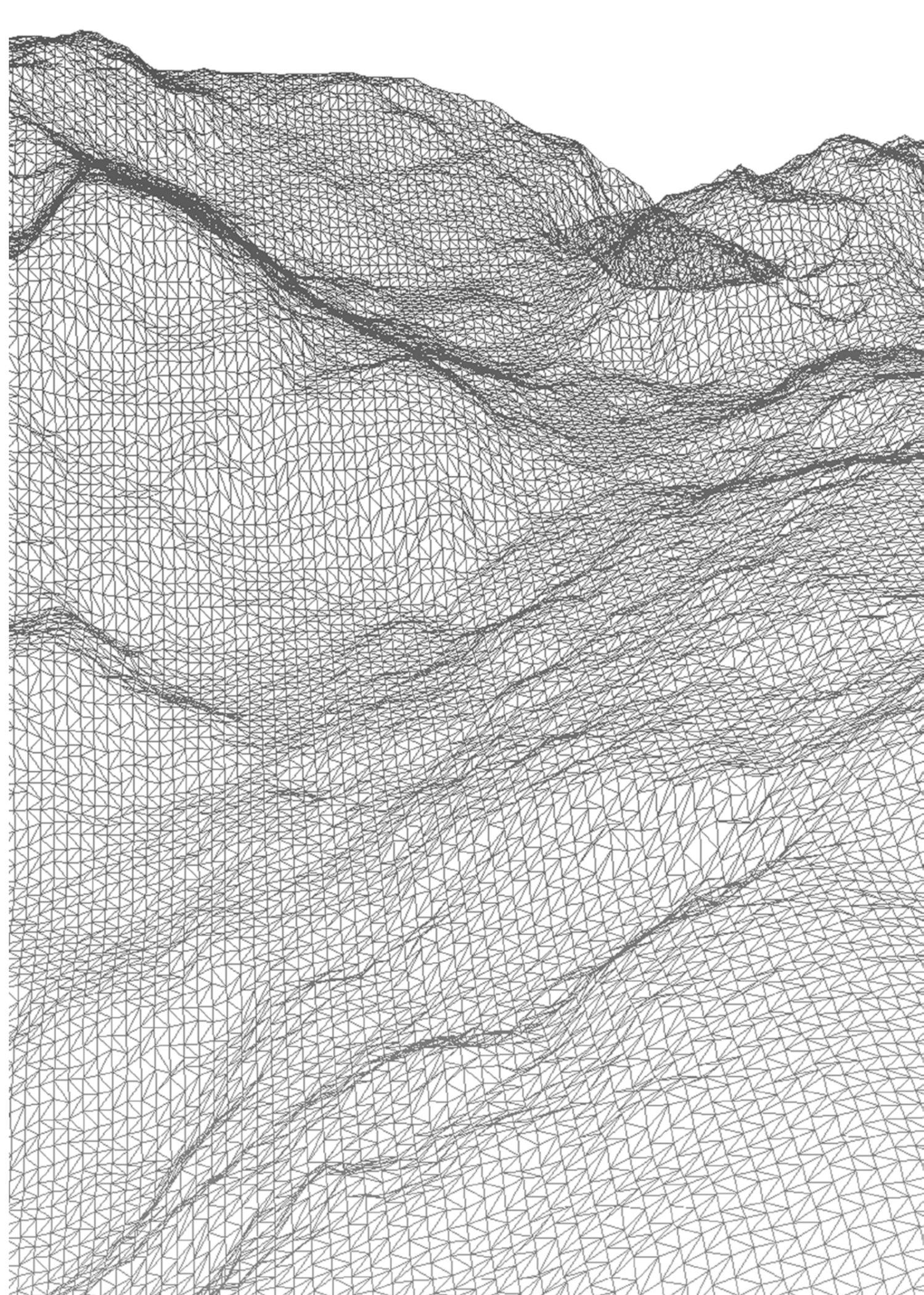
Absolutely NONE of these appeared as such anywhere in our observable reality, yet treating them in this way - idealising them - enabled the Forms so extracted to be studied in their own terms alone, and their formal properties greatly helped in their pragmatic use, in a World which never matched the ideal completely, but certainly near enough for effective use!

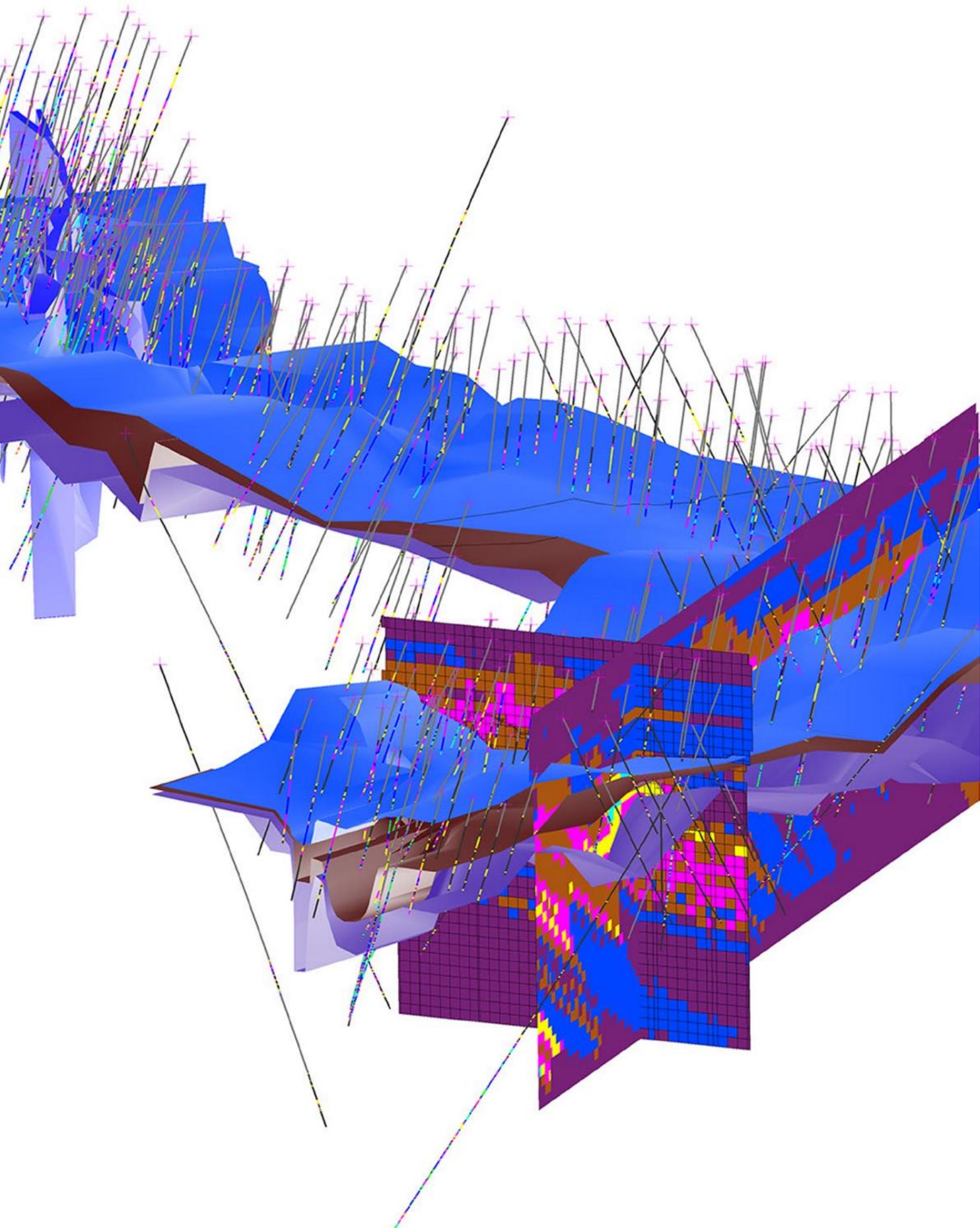
That achievement was, of course, the invention of Mathematics, which from the outset was the study of Pure Form extracted and idealised from Reality. The rough mappings of natural occurrences were soon improved by “farming” situations and tailoring natural forms to bring things as close as possible to the Ideal!

What was achieved was certainly “of Reality”, but neither was it Reality itself, or in any way the cause of the phenomena being studied. It was an idealised purely formal version of what occurred in many different places in Reality, though always compromised there. These perfect formal extractions comprised a separate World involving ONLY the idealised versions of Pure Forms, and absolutely Nothing Else! It is corrected referred to as Ideality!

Now, quite clearly, the mathematicians do not want to be encumbered by the unavoidable messiness, and the incessant problems, of the Real World, so they perform their investigations entirely in a place where such messiness has been totally removed, leaving only the delight of their lives – Pure unadulterated Form; they limit themselves solely to Ideality!

And that is easy to do: all you need is a piece of paper and a pen, and you can bring in one perfect form after another, and study them in their own terms alone. It is indeed a joy!





Now, this still isn't a monumental indulgence, for these achievements can be re-applied back in Reality, as long as their chosen locations have been effectively purified as far as humanly possible.

Mathematics is, indeed, the Study of Pure form, and very useful in innumerable practical problems.

BUT, and it is a big BUT, Form alone is wholly insufficient in the objective of understanding Reality.

For that the Content and properties of the Real World are essential. When the route is from Pure Form to explaining Reality, the possibilities of significant contributions to understanding are absolutely NIL!

NOTE: Mathematicians would disagree, but it always becomes clear that their "achieved Understanding" is solely about Form, and never concrete Reality.

How can physicists like Tegmark insist that Forms actually drive Reality?

It is entirely because the Forms can be made to map onto areas of Reality as long as it is appropriately "farmed" to bring the situation closer to the ideal. Not only has literally everything that is not part of their Form been removed from the "farmed" Domain, but the effectiveness of their Form is given all the credit for the success. All the farming and control are ignored!

They don't, and indeed, can't, be included in the idealised Forms. In fact the real situation, including all this modification is just forgotten. Instead of being correctly seen as the actual facilitators, these worshippers of Form are convinced that they have revealed the real (?) causing essences as embodied in their perfect Forms.

They, as Marx would have said, are standing on their heads, and must be inverted to stand upon their feet!

Philosophically, these people are kind of Platonist. For, like Plato, they seek the "ideals" of Reality as its motive forces. Yet, like Plato, they are also incapable of achieving anything in totally unfettered Reality

To achieve that, another type of specialist is necessary, which has become an expert in "Reality Farming": we call these specialists *Technologists!* And, it is they who are considered the heroes of the present-day World. Isambard Kingdom Brunel is the prototype!

So, what can we have under the catchall heading of Science?

We have the scientists who study Reality and attempt to understand it.

Then there are the mathematicians who study Ideality and attempt to understand that!

And finally, we have the technologists who can tailor Reality to conform to Ideality so that idealised relations can be effectively used in their constructed Domains.

And the philosophies of these different groups necessarily differ significantly! The scientists are materialists looking for the meaning in Content. The mathematicians are idealists looking for meaning in Form alone. The technologists are pragmatists who don't care about any sort of meaning, but concentrate upon using the discoveries of the scientists and the Forms of the mathematicians to predict and produce things by means of their consummate skills in tailoring Domains to enable success!

Glorious Form & Irrelevant Baggage?

Max Tegmark, at one point, relies upon the game of Chess to establish his particular view of the Universe. How is that for profundity? Of course, the game is interesting, but most certainly not for what it tells us about the Nature of Reality!

But, it does certainly show, as Tegmark affirms, what abstractions are, when confronted with a man-devised, but surprisingly complex, game.

For, what makes the game what it can be, is independent of the materials used, the individual shapes or names for the pieces, and even the composition of the board. It relies solely upon the man-devised rules of both “moving” and “taking” of the opponents pieces, and on the invented objective – to put the “king” of the opposing side in an inescapable position – Check Mate!

But, he considers that such a game is wholly “baggage-free” as distinct from the baggage that we usually associate with all phenomena.

NOTE: Tegmark actually dismisses concrete Reality, and not just the scientists' explanations of it. For, if it is only his “non-baggage” essences, which are always non-physical, that is always disembodied, abstract Forms, then anything that isn't such a Form is his “disposable baggage”.

Indeed, the various physical interpretations that human beings put upon natural phenomena are irrelevant, and indeed “hide” his “true essences” – the abstracted “Natural Laws”, which can be extracted from the confusing World by appropriate methods.

Tegmark clearly delights, primarily, in Form.

He isn't a physicist, but a mathematician.

But, where does this position him with respect to concrete Reality?

It clearly makes him discount everything (as baggage) apart from Form, which he turns into “Laws” – the “Essences”, determinators and indeed drivers of all of Reality!

He makes the classical error – the idealist mistake of worshipping his own creations (like a graven image), and hence seeing the formal result of real physical causes, as the actual causes themselves.

What did Marx say about Hegel's idealism? It was that he needed to be stood upon his head, or rather on his feet.



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