

ISSUE 45 AUG 16 JIM SCHOFIELD



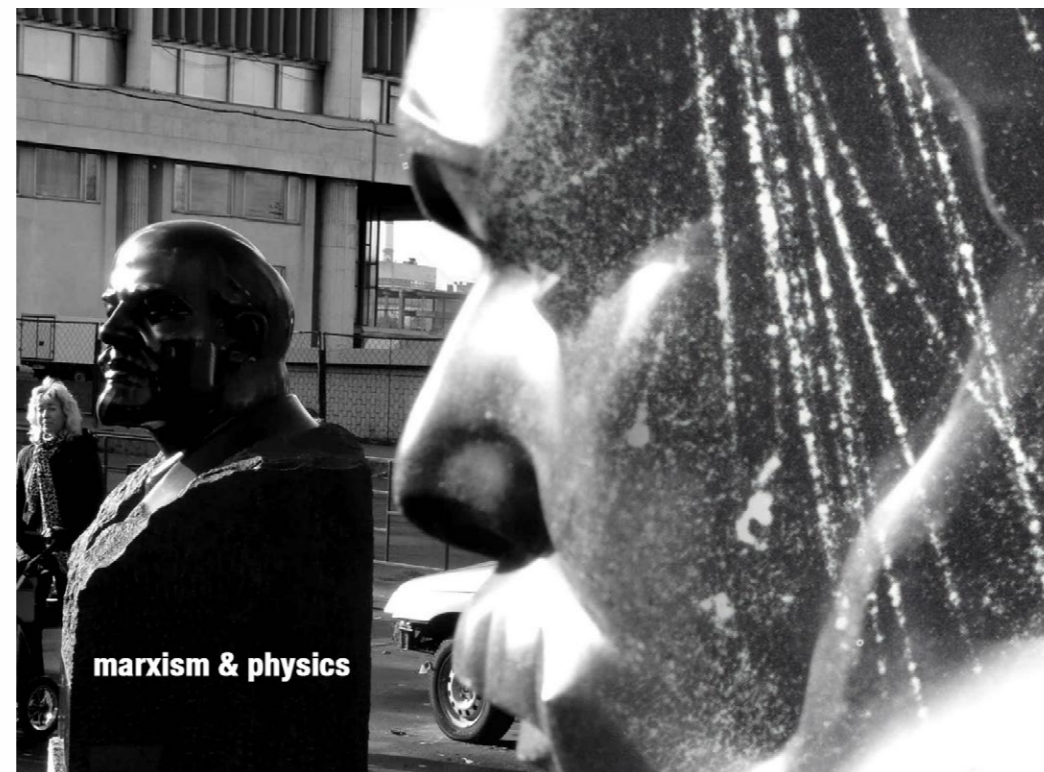
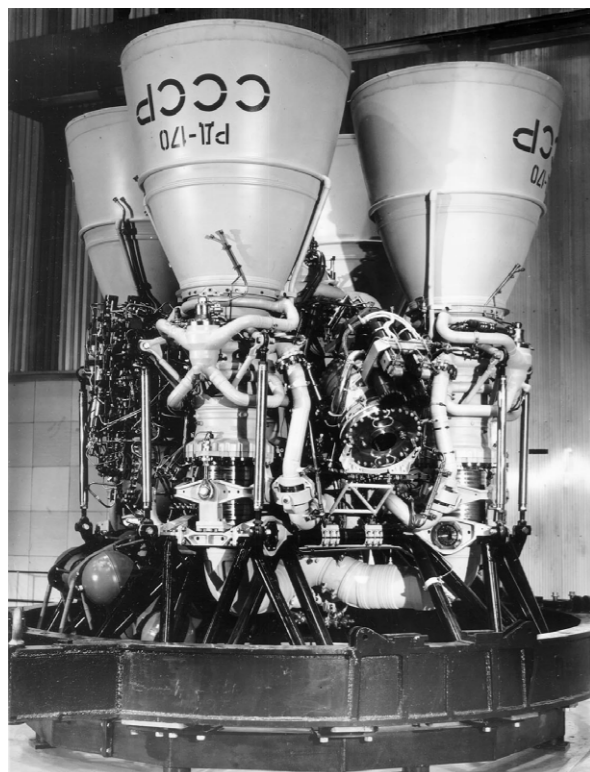
SHAPE JOURNAL

**BOTTOM UP!
MARXISM & PHYSICS SERIES**

ELEMENTARY PARTICLES / ACTUAL ORIGINS / UNIVERSAL SUBSTRATE / EMERGENT ENTITIES

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Marxism & Physics: Bottom Up!

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4. Preface
7. Elementary Particles
12. Actual Origins
16. Second Generation Material Particles
23. Electromagnetism as a Single Property
25. Universal Substrate Units
28. Emergent Entities and Properties

Preface

bottom up?



Welcome to the 45th Issue of the SHAPE Journal, the start of a new series of papers on *Marxism and Physics*.

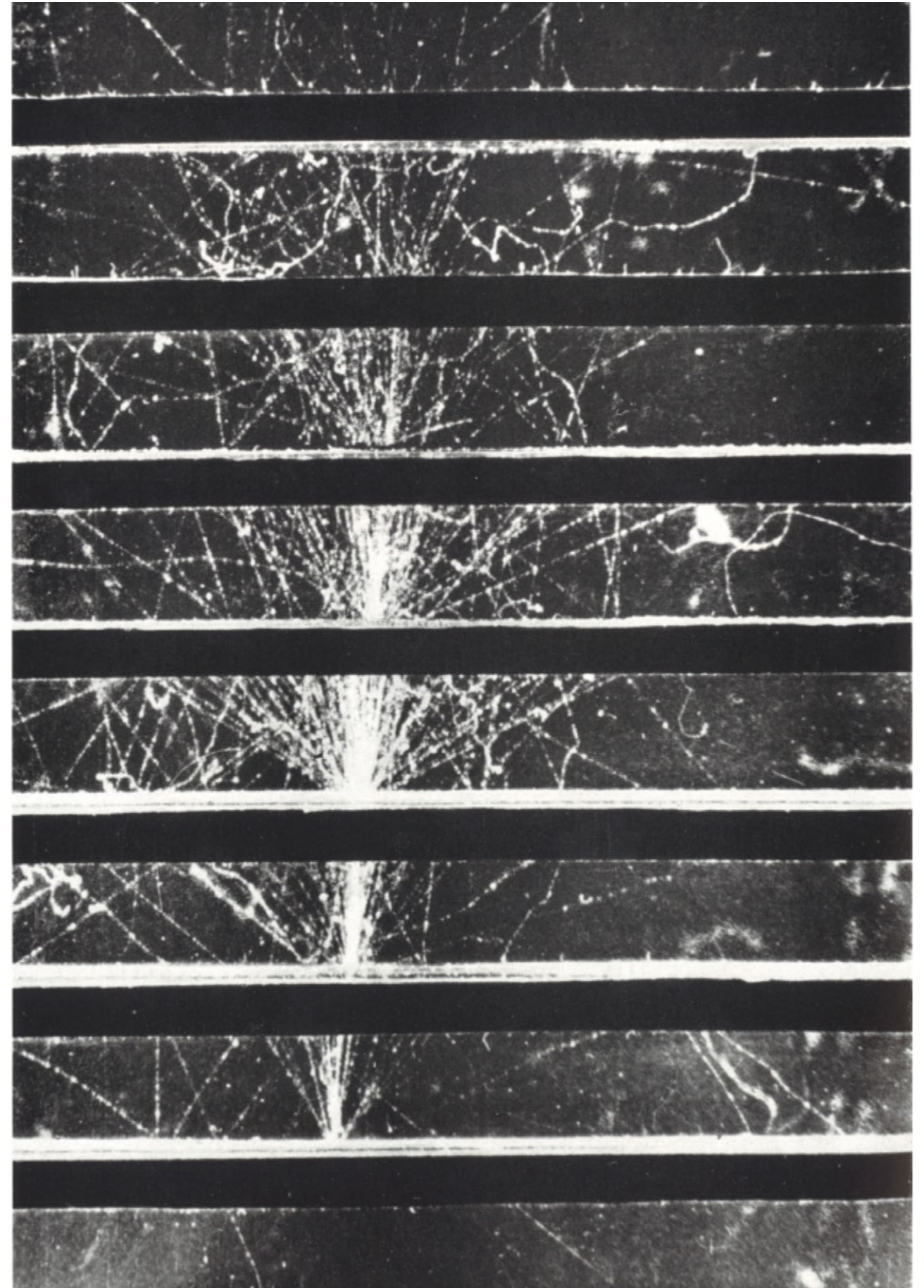
This edition of six papers is a recently completed section of a three-part series developed during the summer of 2016, the latest in an ongoing attempt to counter the current consensus in Physics by a Marxist scientist and philosopher.

Two other sections were also produced between June and July this year, but this one, which I have entitled *Bottom Up*, is a wholly new slant upon elemental particles, and the early evolution of our universe.

It isn't the last word on particle physics by any means, but it is a significant rebuttal, written after this theorist made profound contributions upon the famed Double Slit experiments, Quantum Entanglement and quantised orbits.

The rest of this new series will be published here and on the Shape blog in coming weeks.

Jim Schofield
August 2016





Elementary Partices

		Model of Elementary Particles								
(Name)	Electric Charge	Three Generations of Matter (Fermions)			Force Carriers (Gauge Bosons)					
(Symbol)	Number of Color Charges									
	MeV									
Q u a r k s		I	II	III	Photon	0				
	Up	+2/3	Charm	+2/3	Top/ Truth	+2/3	γ	Electro- magnetism		
	u	3	c	3	t	3				
		~5	~1350	> 131000						
	Down	-1/3	Strange	-1/3	Bottom/ Beauty	-1/3	Gluon	8	Strong Interactions	
	d	3	s	3	b	3				
	~9	~175	~4500							
L e p t o n s	Electron Neutrino	0	Muon Neutrino	0	Tau Neutrino	0	Z zero	0	Z^0	Weak Interactions
	ν_e	< .0000070	ν_μ	< .27	ν_τ	< .31	91187			
	Electron	-1	Muon	-1	Tau	-1	W plus minus	± 1	W^\pm	80220
	e	.511	μ	105.66	τ	1777.1				

A slow, questioning look at the above table poses more questions than answers! It purports to be the latest version of a list of the fundamental, Elementary Particles from which absolutely everything in the current Universe was, and still is composed. Yet, only 7 out of 16 are said to be "stable", and, of these 7 are so called bosons - swapping particles that effectively replace forces entirely, so we are immediately down to 5, which appear to be the particles of matter which are our basic, stable building blocks!

Now of the 9 "particles" identified as "variable" (that is they are not stable - and of intrinsic necessity, turn into something else after a very short, even ephemeral, life), the amounts of energy required for their formation can be in the GeV range, while some are said to exist for as short as 10⁻²³ of a second! So, their places upon such an important, basic-particle-list seems entirely unwarranted.

And, indeed, any assumed-to-be comprehensive list, which seems to be more about dissolution than aggregation, hardly fills us with confidence that the

actual trajectory of Development of Everything hides in such a list.

And, as literally all the members were discovered, solely, by the totally destructive paradise of all sub-atomic experimentation, high speed Colliders, it is like trying to see how a brilliant wooden toy was built from the collection of splinters produced by its total destruction.

So, it becomes absolutely clear that we must examine the philosophical premises involved in arriving at these ultimate and supposedly "fundamental" ephemeral specks!

For, the most fundamental premise underpinning this list was a belief in the Principle of Plurality! This universally assumed premise is extremely ancient, and rarely consciously admitted to. Its age is indeterminable but it has probably been around as long as Mankind has thought about his environment.

And, this premise is what also underpins both Analysis and Reductionism, precisely what allows our scientists to consider a totally uninterrupted path of Causality, all the way down, to a final collection of “Elementary Particles”!

So, finally arriving at this table, this model, was considered not only possible, but also absolutely essential.

Yet, the unavoidable question arises, “How should we consider these odd, and mostly ephemeral, fragments of Reality, if we decide to dispense with Plurality, and instead take the exact opposite, Holist Stance?”

Well, that would indeed change everything. For, instead of eternal Natural Laws, plus mere complexity, we would instead think of the Qualitative Changes of actual Development, with long periods of Static Stability, occasionally-yet-profoundly transformed by short tumultuous interludes of dramatic changes - termed Emergences.

For, in this very different scenario, it is the tumultuous trajectory of the Emergence alone, which seems to make sense as the sole theatre of such significant transformations - converting lower levels of Reality into ever-higher levels, at each-and-every such interlude!

Now, this isn't an uninformed speculative jaunt: such as those engaged in by the Copenhagen Interpretation subscribers.

On the contrary, this alternative has many more resonances with the ephemeral, temporary steps that seem to have inevitably occurred, during the developing sub atomic level.

In the Theory of Emergences, every long-standing Stability is finally so internally-undermined that a Major Crisis ensues, followed by a precious Collapse, towards what seems to be Total Chaos - the final(?) Nadir of Dissolution.

But, that doesn't happen!

Instead, a halting rise always occurs and a new, different and higher Stability inevitably ensues, which, after its seemingly interminable existence, is itself also terminated by a new Emergence and consequent higher Stability.

Within this tumult, both going down and going up, transitory products and temporary processes abound, and are in fact essential for the trajectory to occur and finally reach every new Stability.

Clearly, such a stance can encompass the many identified, ephemeral fragments discovered from purposely shattered entities at the Sub Atomic Level. Yet also, it rejects the mere pedestrian complication of the usual pluralist approach.

For, there these fragments will be will be mere transitory, short-term entities in a tumult of many changes, and never the actual building bricks of anything!

Indeed, they were only recognised within the particle-smashing processes of High Speed Accelerator/Colliders: They are short-lived debris, not crucial elements in the process of development of Reality.

Indeed, within the consideration of the trajectory of an Emergence, these would be the waste-products of temporary entities in undevelopable, intermediate processes, quickly replaced by something else, and unlikely to play any significant role in the overall process. It is that constructive set of processes, in the final associative phase of an Emergence, that will deliver the key steps in the creation of Reality, as it approaches what we have now.

We must remember that it is events such as The Origin of Life, the Evolution of Living Things and The Emergence of Consciousness that are the later productions of such processes. Those assumed for current Sub Atomic Physics will never deliver anything in the real processes of Reality-in-Development!

It is a ad reflection upon the decline in a great Science since the victory of the Copenhagen Stance at Solvay in 1927.

Clearly, it has to be investigations into the absolutely essential, creative processes, only possible when preceded by the Well of Despair of an Emergence's Collapse Phase. The problem has to be how to, somehow, arrange-for such calamities, and learn to monitor their re-invigoration into that crucial Final Phase.

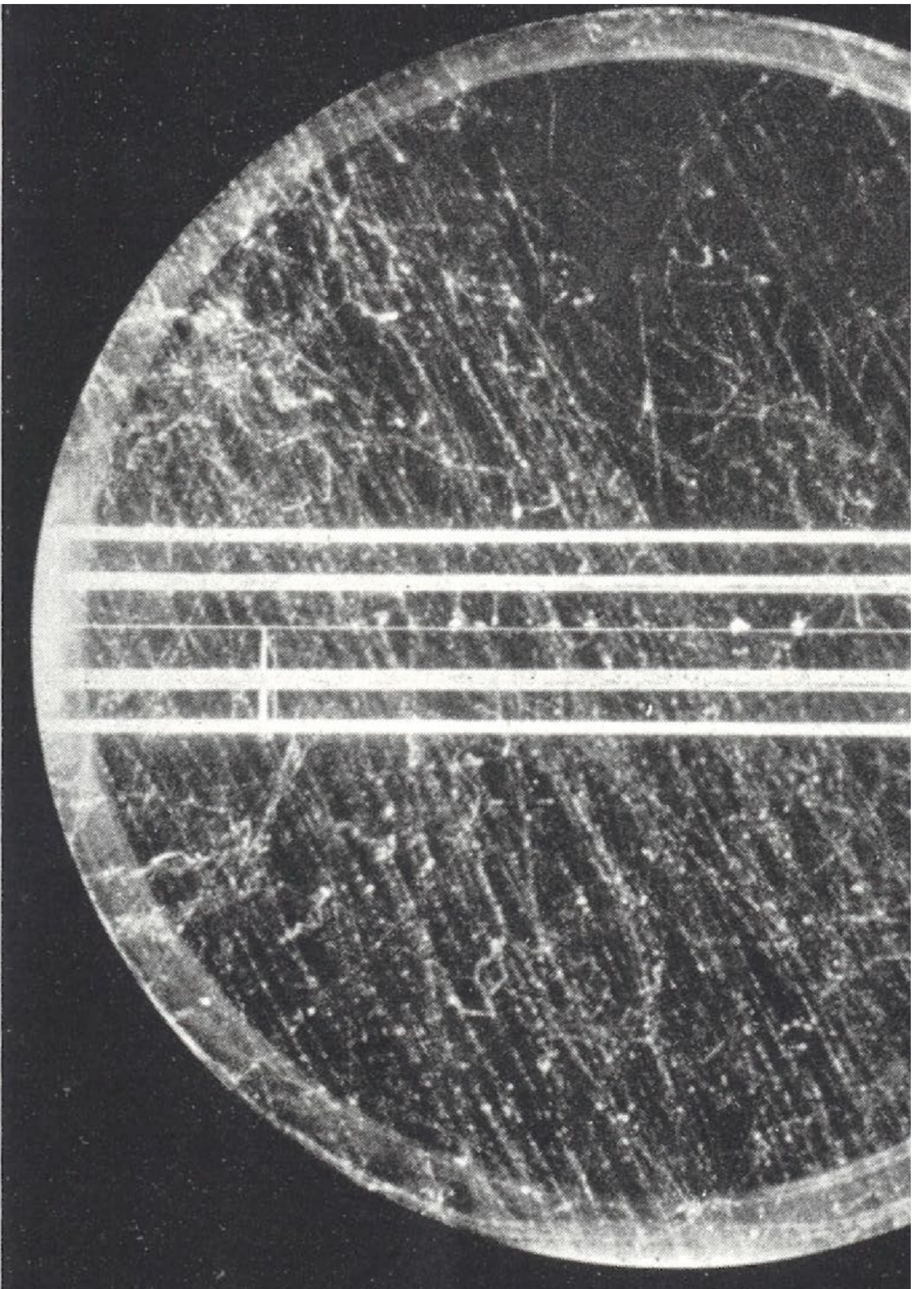
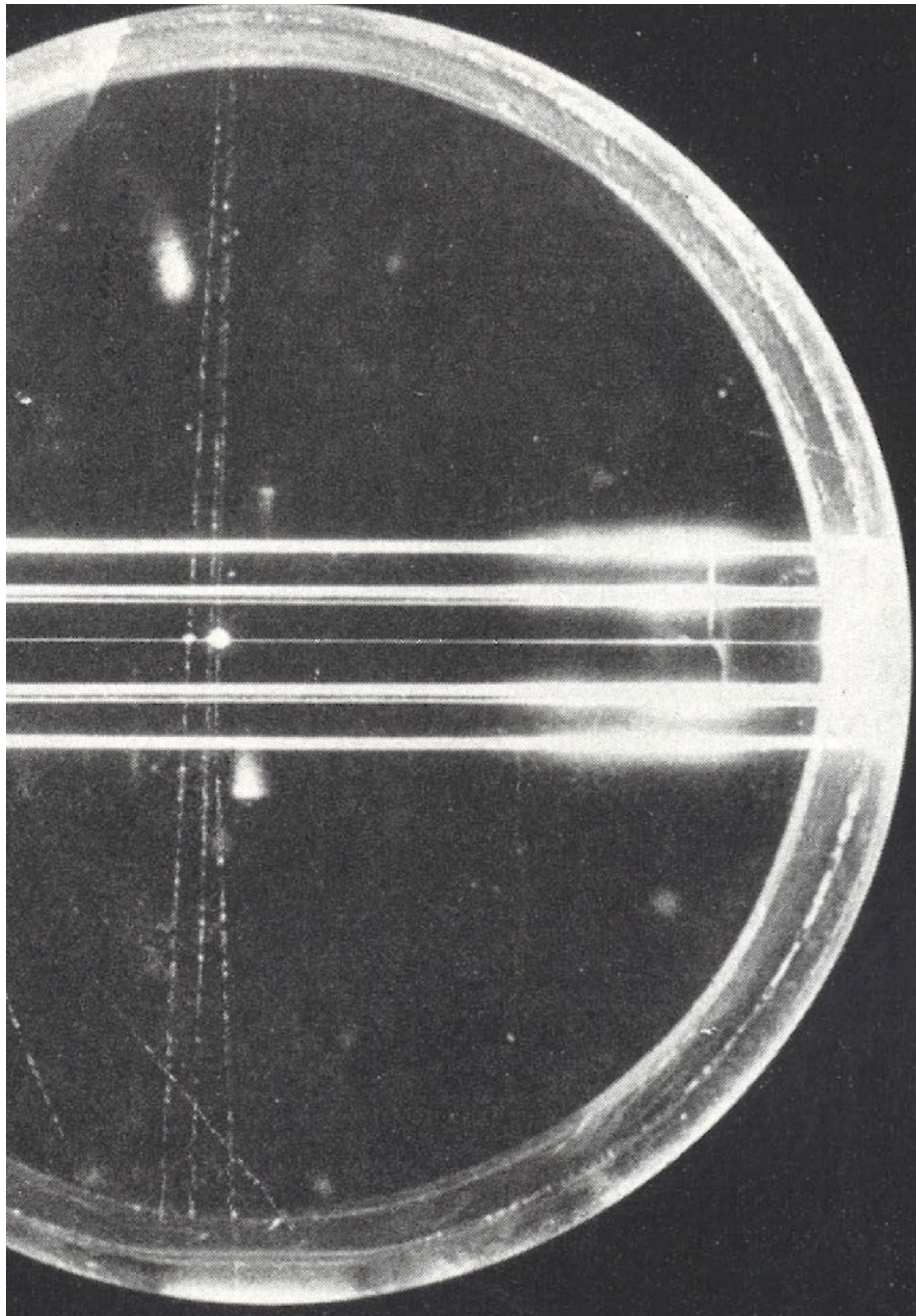
Yet, though it seems like the “Waiting for Godot”, of the next Big Bang, that isn't the only route.

An updated version of Stanley Miller's brilliant holistic experiment, which produced amino acids, in which the sole purpose of each version, in a extended sequence of versions, would be merely to improve the next attempt. It is looking very promising indeed.

And, Yves Couder's Walker Experiments have already pointed the way to “constructivist” ways of investigating phenomena that previously seemed impossible.

Indeed, all the anomalies of the ill-famed Double Slit Experiments have been explained physically by a totally holist approach, and extensive theoretical investigations are dealing both effectively, and purely physically, with nonsense like Quantum Entanglement.

And, clearly, on much smaller scales, the struggles evident in natural processes between evident stabilities must be addressable, but only if we throw away the pluralist set of rules, and investigate what is usually called Total Chaos (not, I must emphasize, the purely formal mathematical Chaos)!



Actual Origins

An Essential Preface

Any alternative to the Demolition Ball of the LHC for investigating the initial Development of the Universe, must start with what bottommost particles that we have now, and, somehow, attempt to devise how these entities originally came to be.

Certain particles, which are stable, seem to offer a promising starting point, but the reasoning, for the necessary investigations involved, will certainly depend upon the underlying philosophical stance consequent methods involved.

The two alternatives are clearly Plurality and Holism.

Plurality assumes a hierarchy of Wholes, composed of Parts, which are related by so-called “eternal Natural Laws”, which, together, allow both Analysis and a straightforward process of causal Reductionism, down through the levels, until a basic set of Elementary Particles are revealed, and it these which are assumed to be the basis of the whole, overall and finally-produced System. Such a stance, basically depends upon Additive Complexity throughout. Individual components are NOT changed by their contexts: they merely add in various mixes and amounts.

Holism, on the other hand, though still talking of Wholes and component Parts, sees “Everything affecting everything else” - so that nothing is independent of its possible contexts, and this includes all causal relationships also!

Crucially, such changeability does not only allow one-way causalities. Most importantly products can also effect their own causes (transform their prior contexts), and the achievement of any consequent Stability is never “Nature’s Natural State” at all, but a compromise or balance involving both onwards and backwards causality, as well as mutual effects occurring between directly competing factors too.

Clearly, which of these basic stances is taken will radically alter the processes involved, and the results achieved.

To even conceive of a set of determining Natural Laws, which are also eternal, puts the reasoning into a clear, idealist stance, for Reality is considered to owe its Nature and development to fixed Relations abstracted by Mankind from Reality.

So, it is clear where the consensus is coming from in addressing these questions. And, the reasons, for adopting such a stance, are clear.

Stability does appear to be the norm, from any particular individual’s perspective: it certainly persists for very long periods, so its general assumption is a reasonable first approximation to take.

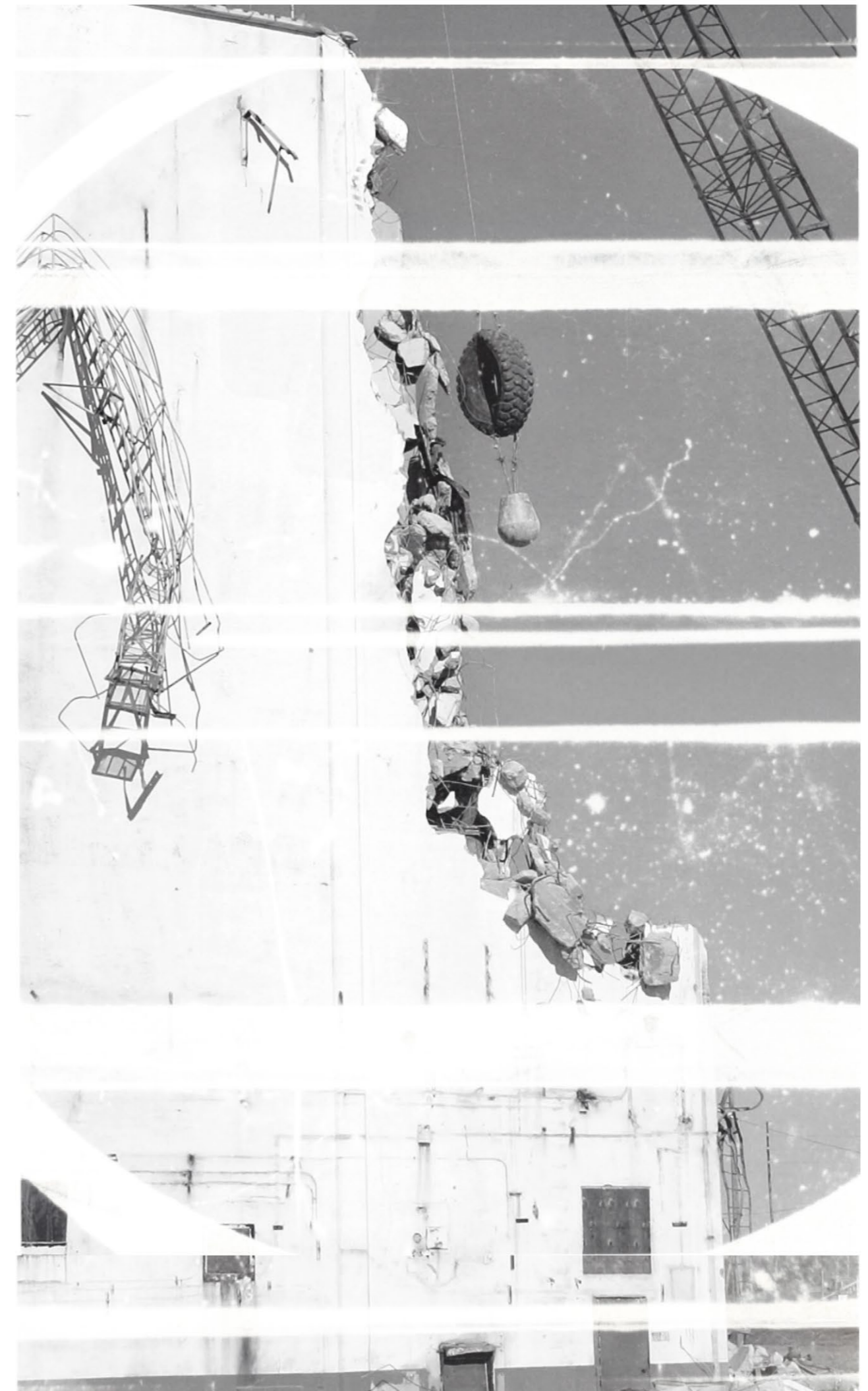
And, within such common and persisting Stabilities, the pluralist stance does, indeed, deliver.

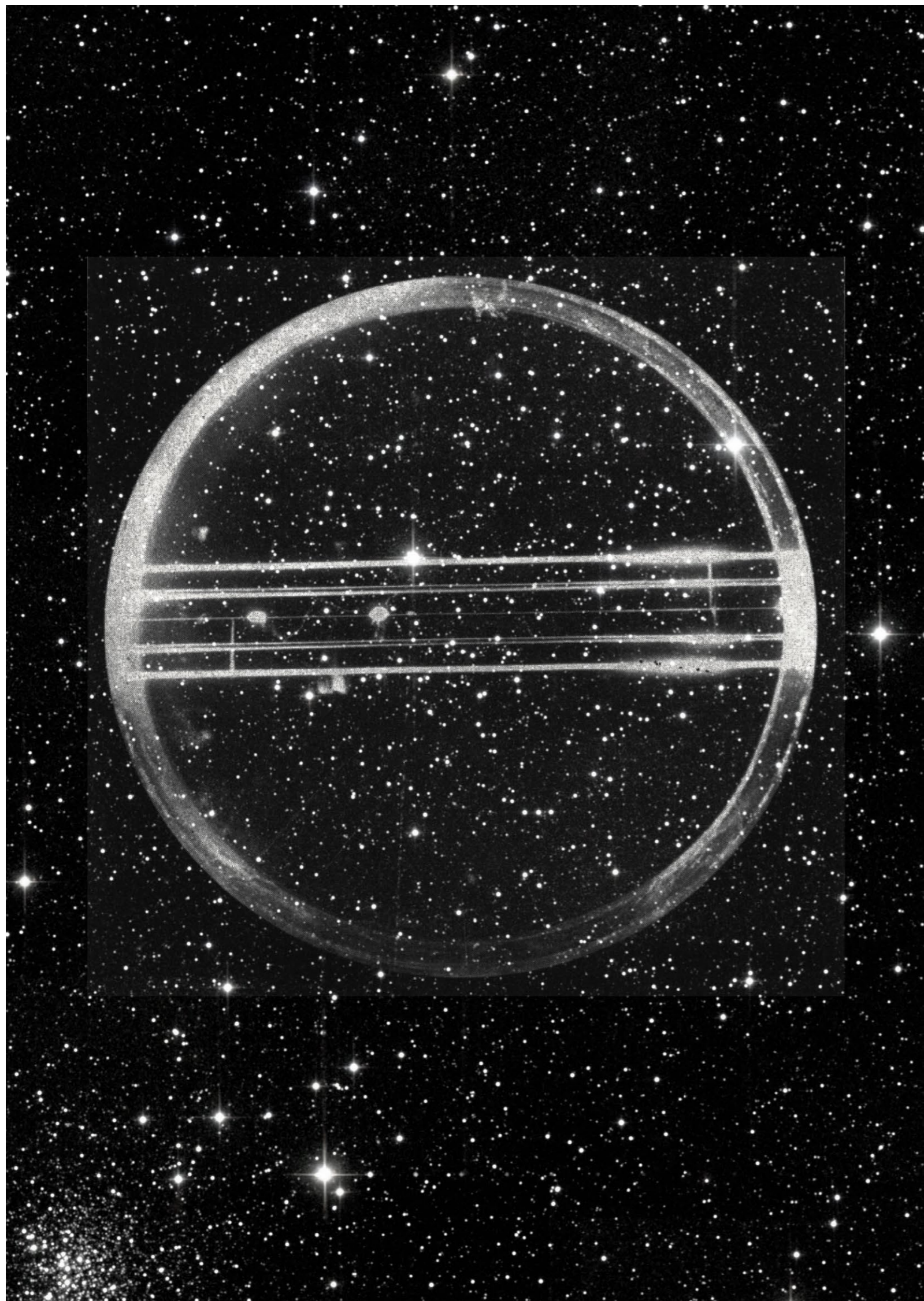
But, in any larger, wider and longer-term perspective - concerning actual qualitative developments, it fails absolutely. Attempting to “analyse” our way back to the Initial Origins of everything will always, via a wholly pluralist stance and methods, result in an invention! And, in the same way a purely reductionist, depth-search, for eternal components, will also fail: it will produce rather than reveal! Investigators will be studying their own current productions, rather than delving ever-deeper into an actually evolving past!

So, it is clear that to embark upon such a quest, it, absolutely, must involve a holist stance and methodology. Let us begun!

The Initial Steps

The most ubiquitous of current particles is undoubtedly the electron. But, it carries a negative charge, and thus infers its opposite - the existence of a positive charge, as there is profuse evidence for these two affecting one another and even cancelling-out to produce neutrality, literally everywhere! So, we may be drawn to another tiny particle - the neutrino, which is about as small as you currently get with stable particles.





Yet, the fact that it is both neutral and stable seems to suggest that even it may be a product of other, smaller entities in some kind of balance? Yet, alternatively, its nature could suggest originality, if, for example, charge is NOT a primary feature!

But, perhaps the key form is the atom?

It consists of a positively-charged nucleus (in its simplest form, the proton in an Hydrogen atom) and an orbiting negatively-charged electron.

Now, such atoms are (mostly) stable, and demonstrate the previously mentioned "balance of contenting effects", in a most remarkable way, by balancing charge-attraction against Kinetic Energy of motion in a finite area - due to the mutual-orbiting of its components!

NOTE: Yet, it must also be seen in the context of the whole set of much heavier Elements, which though constructed upon the same plan, can also have relatively unstable nuclei, involving dissociation via Radioactivity (and hence unstable atoms too).

So, here we have an interesting form - a compound of at least two "elementary particles", which actually integrates energy into a stable form, while also balancing opposite charges.

Yet, though this particular version of these opposites can be extended into more than a hundred different Elements, all with very different properties (underivable from the contents involved alone), but incredibly rich in the further developments possible in which they can be involved, they get increasingly unstable until a final limit is reached.

The atom-form is, therefore, a sound model for what could occur in many different developments.

But, there is still another question concerning the atom's stability, because the (outermost) electron can be fairly easily stripped off its nucleus, in a process known as ionisation, and in liquids even dissolved molecules (combinations of two or more atoms into a wholly new substance, with, once more, properties that are not explained by the components involved), and which can separate in a similar way producing "charged ions" and, thereafter, move about separately in the liquid medium.

Indeed, I am impelled to quote another - the positronium! This joint particle is composed of a positive positron and a negative electron, mutually orbiting one another. One sub particle is composed of ordinary matter, while the other is of antimatter. And, as these two are mirror images of one another, they make a uniquely different mutual-orbiting to the atom: the two particles share the same orbit.

When discovered, in the Tevatron at Fermilab, the positronium was very unstable, so it was disregarded as an unimportant freak. But, it was both created and observed within an artificially conceived of and built High Speed Accelerator.

This theorist, therefore, suggested that in very different circumstances, it could well be STABLE. And, in this form it would appear neutral in charge, neutral in magnetic effects and neutral in matter-type!

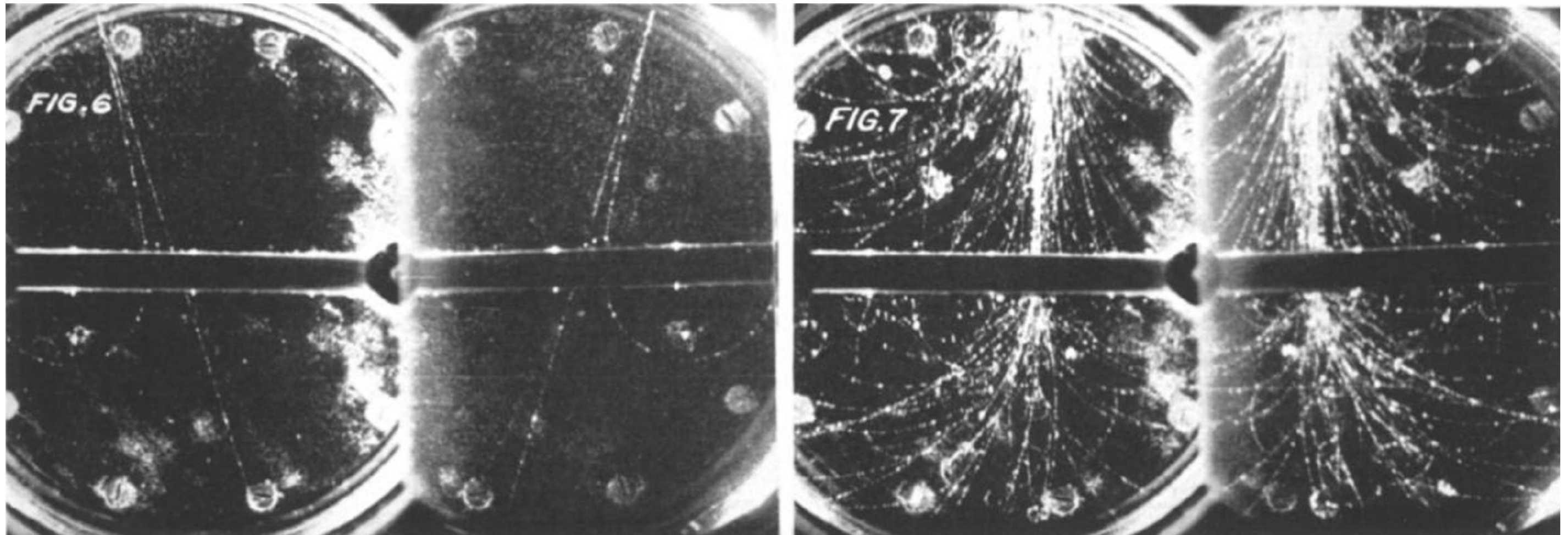
It would be undetectable! But it would nevertheless contain both matter and energy, AND, remarkably, it could take in more energy by the promotion of its orbit, and release that energy by its demotion.

This theorist decided to investigate this joint particle, and renamed it as the *neutriron*. It was also seen as an important alternative model for other joint particles. Its undetectability and energy-carrying capabilities, certainly promised a great deal in several crucial areas of Physics - not least as units of an undetectable Universal Substrate!

Now, it seems to me that the two models (of the atom and the neutriron) seem to ask many of the right questions about both Origins and Development.

Fred Hoyle, the English physicist, developed a Theory of Star Evolution, which seemed to encapsulate also the History of the Development of Elements, via a sequence of phases in the evolution of individual stars, and this still stands as a viable theory to this day!

But, the major hole in the current overall theories of the Universe, resides in the assumed nature of so-called Empty Space, and the means by which Electromagnetic Energy - Radiation, with definite oscillation frequencies, and involved energy, for none of this is explained at all! More will undoubtedly follow!



Muon and Electron in a cloud chamber

Second Generation Material Particles

Let us assume that matter and antimatter are not equal and opposite forms of matter, and positive and negative are not equal and opposite forms of charge. Instead, we consider another form, which is naturally neutral.

To get the above seemingly Dichotomous Pairs of properties such as matter-types and charges, we can see both matter and antimatter as linked properties of incomplete parts of an original neutral form of matter. And, this being so, those fragments will also display the also linked fragmentary versions which seem to have opposite charges.

After all, opposite charges attract one another - as if to regain that original whole form. And, the current stance

on matter and antimatter is that they too vanish in what is assumed to be mutual annihilation, but could be mutual cancellation by a re-association of some kind.

Now, if such suppositions are true, a trajectory of development that could have been produced from something which preceded it, that was a neutral matter form. And, it would then be the splitting of that form which delivered the oppositely-charged fragments, each also consisting of one of the associated different forms of matter, which, apparently, link indissolubly to the two opposite charges too. Opposite kinds of matter are believed to deliver opposite charges - the classical example being the electron and the positron!

These are actually mirror images of one another in every conceivable sense. One is negative-and-matter, while the other is positive-and-antimatter: clearly these properties are not totally independent of one another, but in the way we are considering them connected features produced by the splitting of the original form! They are created properties along with the created fragments.

Let us push the boat out even further, the re-association of matter and antimatter fragments which is said to produce mutual annihilation, becomes, with this alternative set of premises, merely the reconstitution of the original neutral-in-every-respect form: it has been annihilated in its previous incarnations, but still exists though it cannot be detected!

It will, of course, keep the Kinetic Energies of the two fragments internally.

[See the work by this theorist on the neutrutron - a mutually orbiting pair, consisting of one electron and one positron, with the capability of holding energy both in the constitution of their joint orbit, and in its potential promotion {like with the atom}. but, indeed, producing a wholly NEW association of these two fragments into a different product (or maybe it is that original source from which they both emerged), but it is always possible that they do not join with their original partner pieces, but with fragments from a quite different source, which displays these same properties in its pieces. The neutrutron is perhaps a particular example, which was conceived as a wholly new entity, when first produced.]

We have no idea of how we got to that stage, for enough other combinations could occur due to other dissociated forms, and recombinations would be possible between non-original bedfellows. It was long ago, but once it began to be rent asunder into what we see now, there was no easy causal way back to deliver the actual trajectory of evolutionary events.

Let me clarify what I mean by all this, with a much later revelatory example! When plants arose based upon photosynthesis, they began to release Oxygen as a waste product. In time that Oxygen became so abundant in the Earth's atmosphere, that it transformed the environment from the very conditions that had made the producers of that change possible. Indeed, the abundance of Oxygen allowed animals to emerge - an entirely new form of life, and allowed many things to be able to burn for the first time. Even what are now considered the most inflammable substances, like Hydrogen, could not burn without Oxygen. The point is clearly that there are always such recursive-and-revolutionary effects of evolution, which are transforming the context, regularly, in short emergent interludes, that change the game profoundly. And, as research into such Events have shown, it happens in totally non predictable ways, so that future possibilities are never solely defined merely by knowing what a situation was at a certain time!

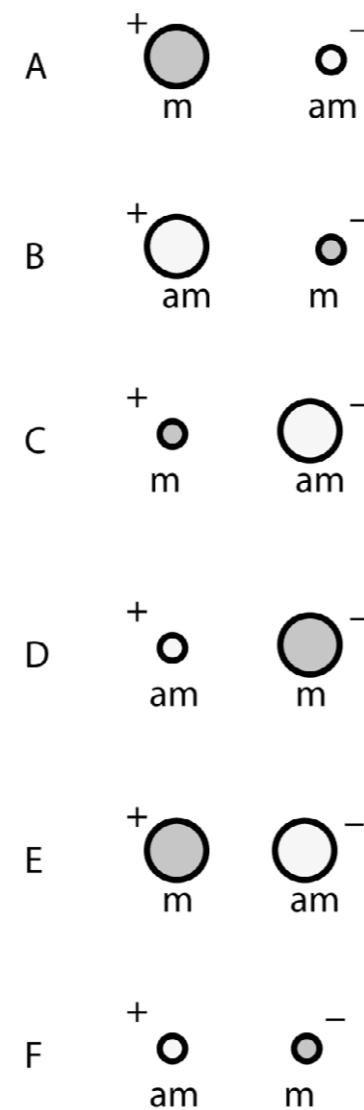
Under new neutralities that could be produced that would also be stable, a new era with new possibilities could be set in train.

Indeed, the atom is a perfect example of this. It is stable and persists Universe-wide, in spite of originating as a new kind of association. And, that same atomic structure allowed many more such associations, but with each possibility possessing a wholly new set of properties - inconceivable from the point of view of their prior level.

For such to occur, it is certain that our so-far considered example of originally neutral matter would not have been alone. Other different neutral entities also involving both matter and antimatter, as well as negatively and positively charged potential fragments will have existed. But, the original entities could be of different sizes, so any dissociations would deliver charged fragments of different sizes, which could re-associate not to simply deliver the same thing again, but with compatible charged fragments of other prior forms to produce something entirely new.

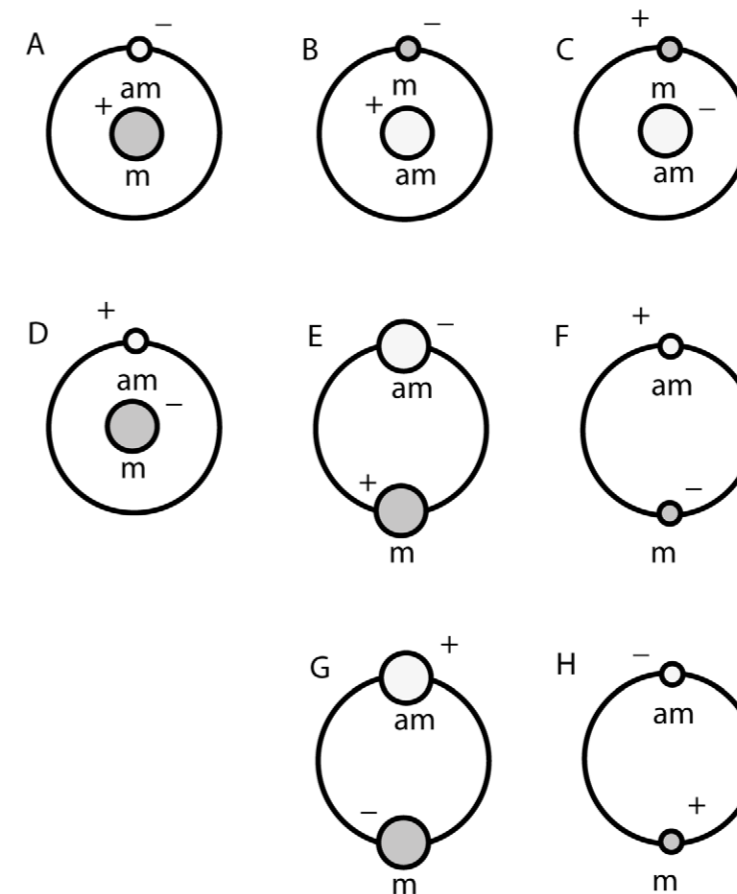
Now, clearly, so much of this is supposition that an initial set of formal possibilities must be fully considered.

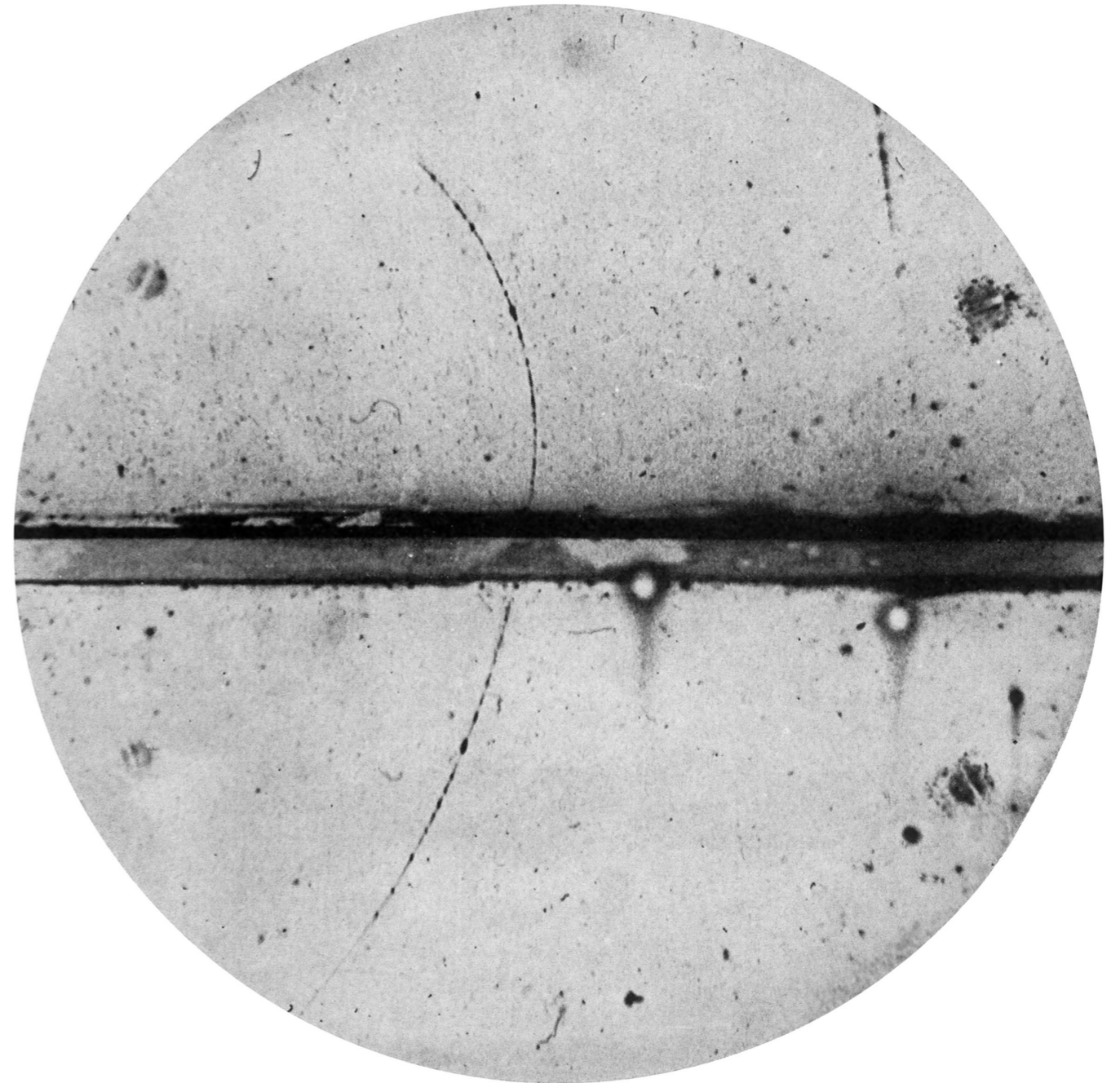
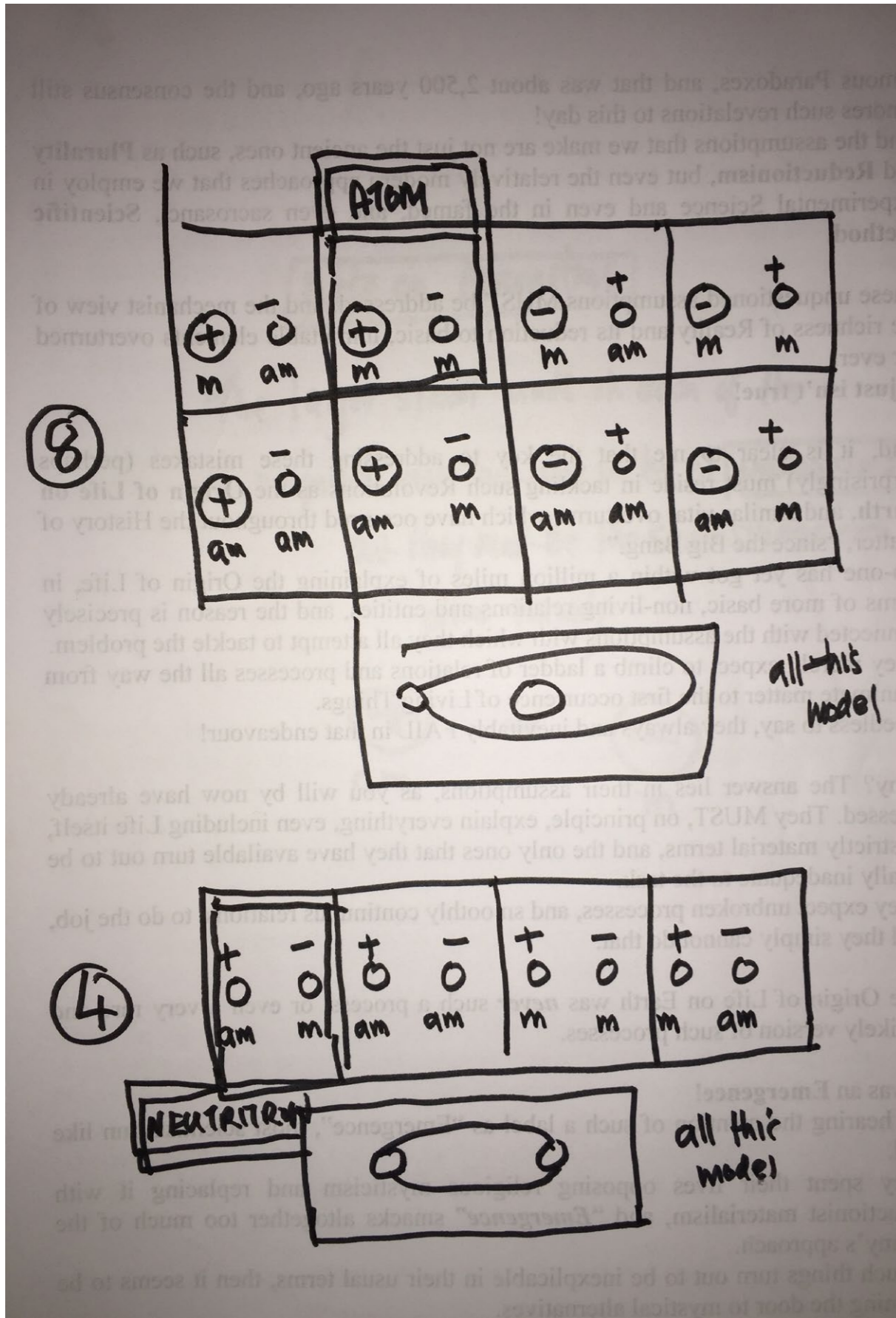
We could have the following, if there were two neutral entities of different sizes for the initial content. Then splits, to produce positive and negative, and matter and antimatter components, could then form the following possibilities:-

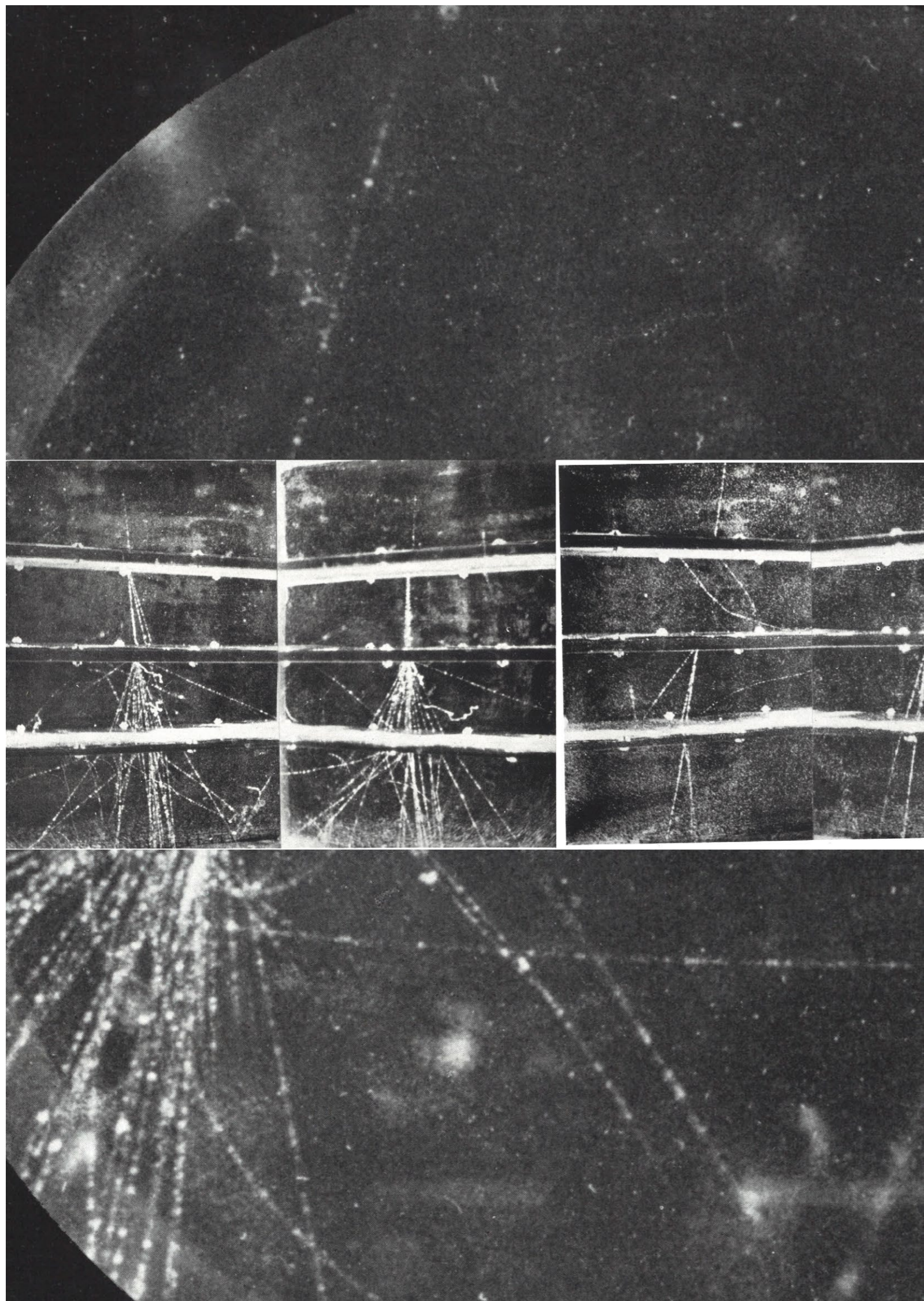


All these would link electrostatically, that is by charge, and could, by mutually orbiting one another (on the model of the simplest atom).

Clearly, with two sizes Big(B) and Small(s), matter(m) and antimatter(am), and finally positive(+) and negative(-), there would be 8 different products when different sizes are involved, and 4 when same-size components are involved.







Electromagnetism as a Single Property

Now, once a Universal Substrate has been established, the whole area of electromagnetic effects comes back into primary focus, for the joint explanations of that Substrate, and, of course, Electromagnetism too!

Why?

It is because it is that Substrate which propagates electromagnetic radiation to every corner of the Universe, at colossal speed, and almost qualitatively completely unchanged in its composition. To do this, the Substrate must, itself, be essentially electromagnetic, and in a truly remarkable way!

The whole area of Electromagnetism simply must be encapsulated in the Substrate's composition, so that a sound, consistent and convincing description and explanation of that Substrate, should intrinsically also deal with Electromagnetism in general. And, that will be a very big requirement indeed!

But, we will have to start somewhere, so let us begin with our separation of electrical and magnetic fields (which, of course, must also be delivered, physically, by such a Universal Substrate)! This separation is emphasized by the kinds of experiments that have been carried out previously.

So, to come at the questions involved from an unusual philosophical angle, I am going to consider the concepts of electrical and magnetic effects as a man-made, Hegelian Dichotomous Pair of concepts, arrived at to simplify dealing with them.

They may not be a classical Dichotomous Pair, which with Hegel were always embedded in Human Thinking or "Reason"! But, the well established method of simplification and idealisation is clearly evident in how Mankind approached these properties (and actually all others), when they were first revealed.

Now, Hegel welcomed the emergence of these Dichotomous Pairs, because he realised that the rational impasse, they revealed, was man-made. He knew that if he investigated the premises on which both arms of

the dichotomy were based, he would find, on rigorous investigation, that either there was an error there, or an important omission, which led to that dead-halt in reasoning.

And, if those premises could be corrected the impasse would be transcended into two rational alternatives, with good reasons for which should subsequently be followed.

Now, as a physicist, this theoretician struggled for years to apply the Hegelian approach in Science, but Karl Marx's transfer of Hegelian Dialectics to Materialism, meant that the usual categories of Thinking, would have to be extended when dealing with Physical Reality. Looking, only, at concepts would never be enough!

It was only when it was realised that actual physical omissions would have the same effects, that the consideration of just such a physical omission was considered, in the ill-famed Double Slit Experiments (beloved of the Copenhagen School in Sub Atomic Physics, with their Wave/Particle Duality and Superposition ideas).

And, on inspecting their premises a glaring omission was immediately evident. They predicated a whole rich range of phenomena upon totally Empty Space.

What would ensue if an undetectable, but very real, Universal Substrate was involved?

After sufficient research to establish a model for this Substrate, the Experiments were looked at again, but including an effectible and affecting Substrate.

Every single anomaly of the Copenhagen interpretation of the full set of these Experiments fell away. All the results could be explained entirely physically, with the Substrate playing the crucial role.

Clearly, when it came to Reality, Dialectics had to consider physical errors and omissions as well as conceptual ones.

So, to return to the initial position at the beginning of this paper. The re-integration of electrical and magnetic properties as aspects of the very same things (which was, of course, at least formally encapsulated in Maxwell's Electromagnetic Equations), now becomes necessary in their joint explanation. The usual problem of attempting to deal with a Dichotomous Pair, by attempting to derive one, in terms of the other, was the method applied here too, where the usual one is to see magnetism as "caused by" primary "electrical effects", then switching this completely around, when it seemed to work, which is entirely consonant with the usual get-around with conceptual Dichotomous Pairs.

We have, instead, to ask, "Why a single property delivers each instances of itself as, seemingly, separate properties?". The explanation must be able to show why one is highlighted, while the other is suppressed!

The answer must be in the pluralist mode of both thinking, and even conceiving-and-carrying out of experiments. We inevitably and drastically tailor our experimental environments to selectively deliver only one particular sought-for feature, in order to simplify its investigation. We do it by eliminating, suppressing or controlling all others -leaving clearly displayed our targeted feature isolated and easily both displayed and extracted.

Such "farming" does not do what we think does! It certainly does NOT display our chosen feature as it is in totally unfettered Reality: That is long gone like a wild landscape, and is replaced by created field: literally everything has been removed to leave a handle-able prospect, in which our chosen bits will perform in predictable ways. We will have imposed a man-made Stability upon a domain of nature, which we maintain rigorously, and that is what we will find out about. What we DO NOT get is our chosen feature as it really is, it has been tamed-for-investigation and for subsequent use ONLY in those farmed and maintained conditions. We know about it only as we have made-it-to-be!

So, it is our context manipulation, which unusually isolated only one or the other aspects of Electromagnetism. But, also, because we assume no Universal Substrate exists, we interpret what we have without in any way involving that substrate as a contributor to what we extract.

Now, all this is bad enough, but we then "compound the felony", by our abstractions from it, and our generalisation of the relations found as if they are, not only actually as such everywhere, but also are fixed in all possible circumstances - they are seen as eternal Natural Laws. That last step is the crucial transforming application of the Principle of Plurality, and it just isn't true!

But, nevertheless, unintended evidence piles up that electrical and magnetic affects are indeed intrinsically related.

But, finally, and crucially, our usual descriptive-only methods merely notes relations, without ever explaining why they are the way they are.

Clearly (a la Yves Couder) we will have to devise experiments, which embrace both aspects, simultaneously, and, via similar resonance and recursion techniques to Couder's own work, attempt to create incarnations of both aspects in a clear and explicable union.

And, as always in such holistic experiments, the Substrate will be intrinsic to what to what we reveal. Couder did it by removing his model to another level entirely!

His experiment, at the macro level, and using a substrate of silicone oil - separated it from the macro level processes he needed to emulate.

It was a brilliant way to isolate the real features you want to understand and "in another world" replace them by controllable and visible analogies.

Universal Substrate Units what would be required to deliver such a substrate?

If we are to assume an undetectable Universal Substrate, it must have been a very early creation in the History of the Universe, and not only conducive to supporting subsequent colossal developments, but also actually positively encouraging their stability and persistence.

And, in addition, therefore, it must have been composed of extremely early embodiments of matter occurring in remarkably facilitating ways.

After all, the mammoth extent of the Universe was possible, and definitely occurred, with this Substrate as the necessary understory of absolutely everything that was going on, particularly in actually enabling fast and almost lossless communications, particularly of Energy, across vast distances.

So, one aspect of our considerations, into this crucial basis, must be its actual composition, and, clearly, the place we must initially look in, for likely components, has to be in the simplest-possible-forms that could deliver all these things, AND, at the same time be totally undetectable, by all the current means known to an eager-and-investigating Mankind.

The first place that anyone would look, is likely to be the current Standard List of what are deemed to be Elementary Particles.

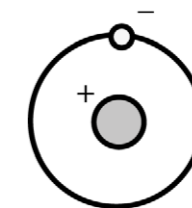
But, right away there has to be flagged up an important danger in doing this.

For, this List is almost solely the product of very High Speed Accelerator Experiments, where a very small number of elementary particles, known from other means, are smashed to smithereens, at ever higher speeds and energies, to see what can be produced, and most of the achieved products last only for tiny fractions of time. Complete experiments only last a fraction of a second, so any development trajectory or time-requiring, recursive effects will have been totally excluded.

Conclusions, from such a limited area, MUST be taken with an almighty "pinch of salt", as has been proved by the remarkable alternative macro experiments conducted by Yves Couder, in which he produced his so-called Walker entities - entirely composed of a single substrate, and absolutely nothing else. And, he even managed to produce their quantized orbits!

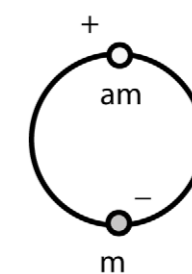
Nevertheless, it is with the results of the Particle Smashers that we must initially look for candidate components for our possible Substrate.

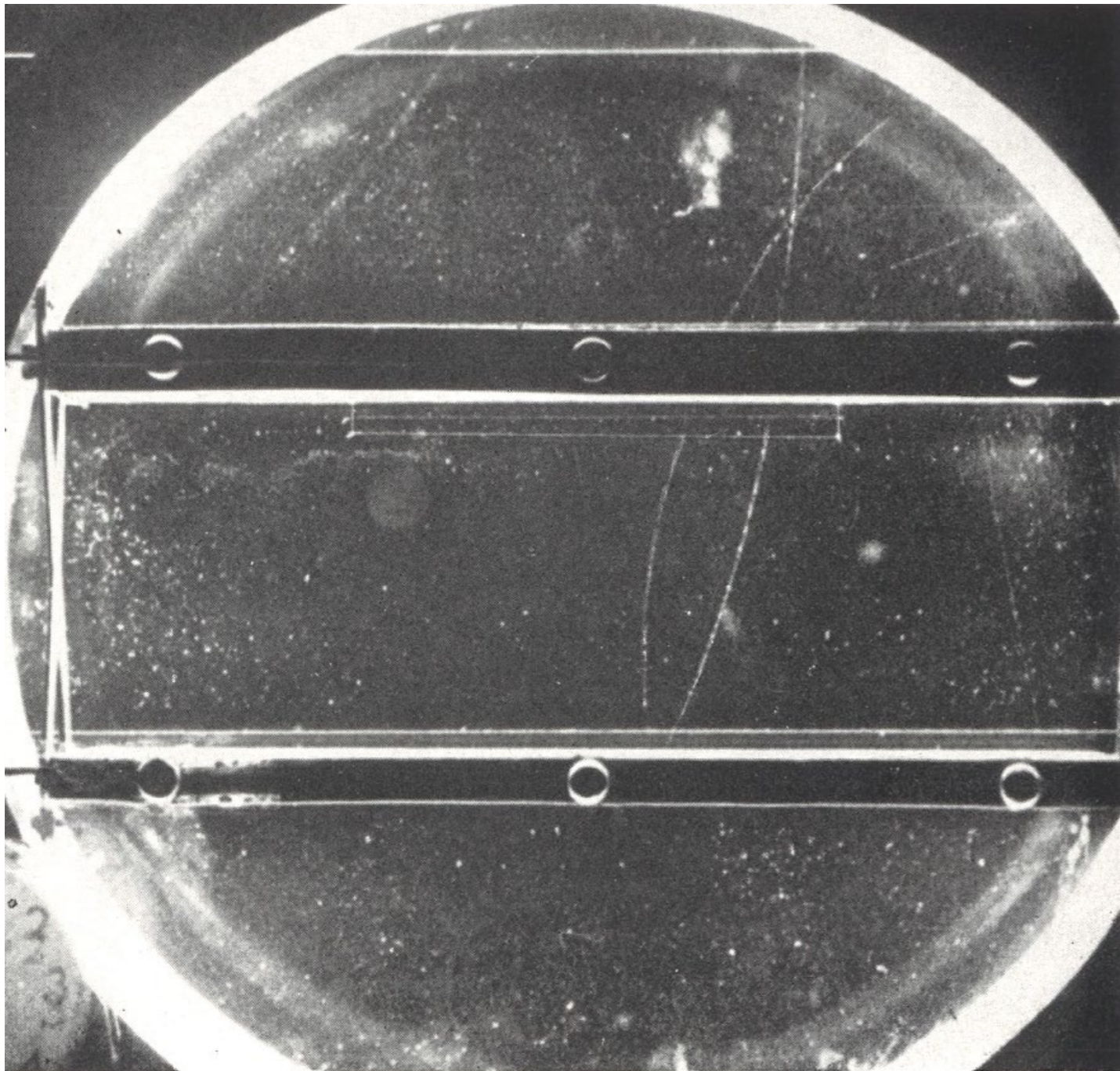
Some candidates, known about prior to the Accelerator Experiments, are the electron and the proton. And an early combination of these two - the Hydrogen Atom, also provides, very early, a significant model for further joint-particles that are remarkably stable.



And, as can be seen, this involves the mutual orbiting of these two entities, but, because of a vast difference in their sizes, it appears as if it is the electron orbiting the proton.

And, this immediately suggested another possibility, not least for its simplicity and form, which is the positronium (neutrtron) which is composed of a mutually-orbiting pair of one electron and one positron.





Muon decay in a cloud chamber

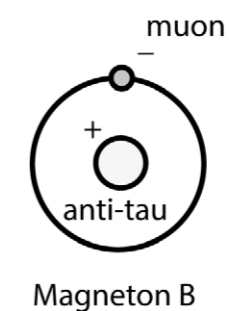
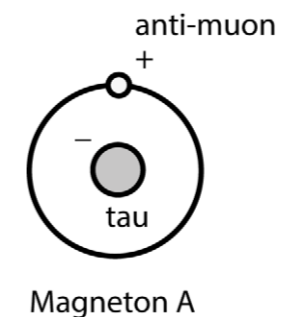
But, as the components are of exactly equal size, (as well as having direct mirror-image properties), these two, instead, shared the same orbit. Now, an important feature of this particle is that it is undetectable: it has no net charge, no magnetic properties and has one particle of matter, and the other of antimatter. It is invisible and hence a great candidate for our Substrate. In addition, like the atom, its orbit can be promoted to a higher energy level, so that it can take in, hold and release energy. You can imagine how it could be the crucial substrate communicator.

Now, elsewhere, (primarily upon SHAPE Journal on the web) this candidate, for the Universal Substrate, has staked the strongest possible claim, not only by delivering the Propagation of Electromagnetic Energy across Space, but also by explaining both Pair Productions and Pair Annihilations, and even delivering a comprehensive, purely-physical explanation of all the many anomalies of the famed Double Slit Experiments. But, it couldn't deliver Fields!

Clearly, there had to be other units comprising the Universal Substrate that could deliver this crucial feature.

Returning to the List of Elementary Particles, the search began for other compound units that could do this. And, they would have to be composed of sub-particles of different sizes, so that the resulting joint-particle would have a magnetic dipole moment.

Indeed, a mutually orbiting pair, consisting of Tau and an anti-Muon particles would deliver exactly that!



But, this would make it easily detectable! So, another joint-particle with opposite properties was sought. And, this was revealed as a mutually orbiting pair consisting of Muon and Anti-Tau particles.

But, how could these cancel out each others properties, on the one hand, while delivering fields, on the other?

The answer was as a randomly moving population of equal numbers of each of these two particles, that as such would indeed become undetectable, but if gathered statically, and appropriately orientated around a charged particle, would deliver the required Field.

Now, this purely theoretical breakthrough is significant. The Universal Substrate with these components, interestingly strongly echoes James Clerk Maxwell's model of The Ether, in being composed of a relatively static paving along with a population of randomly moving particles. In this case, it is the neutritrons that form a loose, but relatively static, Paving, while the two others, termed magneton A and magneton B, would usually be the randomly moving other components, weaving about in the gaps between the loosely-linked neutritrons.

The presence of a charged particle would "capture" magnetons in concentric shells around it, thus building a Field, and the energy for "actions" of that field would be gathered entirely from the Substrate-in-general, as ALL the units are capable of having their orbits both promoted and demoted. This would make the substrate both a universal Sink, and an ever-available Source of energy for Field Effects. The charged particle would need to deliver NOTHING but their charged presence!

Emergent Entities and Properties

Perhaps, the suggested idea that the original form of matter was neutral, and that the matter/antimatter and positive/negative dichotomies were merely asymmetric features of fragments of previously existing neutral entities that were of a different kind, to those than, we are aware of today, is not entirely convincing?

Then, perhaps, a more believable development is that the so-called original substance involved was itself a development of something even earlier?

But, in establishing that as a stable new substance necessarily must have involved balances of counterposing properties, which, in union, created internal forms of sub-units that had new properties like “positive and negative” as becoming possible for the very first time, with the weakest fault-lines, being where these actually occur. And when conditions forced a dissolution, it was invariably along these positive/negative “fault lines” that the separation was most likely to happen.

Of course, such a kind of dissociation would necessarily deliver parts with opposite “charge” properties, which would not be the natural properties of natural component parts, but of these artificially produced fragments, breaking along these types of areas. The fragments would, quite naturally, be “mirror image” pieces, showing an affinity for the “opposite charge”.

Such a suggestion as this isn't that far-fetched, for the Emergence and prior Stability that had produced our assumed-to-be original substance, will also have changed the old environment that produced that then-stable substance, and if the subsequent dissociation was caused by another Emergence, even the condition for that, would also contribute to delivering a new environment once again.

Such Emergent-Interlude upheavals, are precisely why the many attempts to explain things like the Origin of Life always fail, for the causes in the pre-origin conditions, aren't there anymore.

NOTE: It is fully appreciated that these sorts of explanations are hard to believe, especially with a background of pluralist thinking.

Such ideas can only come from a rich and long, holist experience, and that is almost impossible to come by. So, those who require a fuller explanation of the holist approach, are directed to the Special Issue of the SHAPE Journal dealing with The Theory of Emergences on the Web.

Now, if the reader thinks that such properties as “charge” are revolutionary creations, I can only ask, “What about Life?”, and even more amazing, “What about Consciousness?”

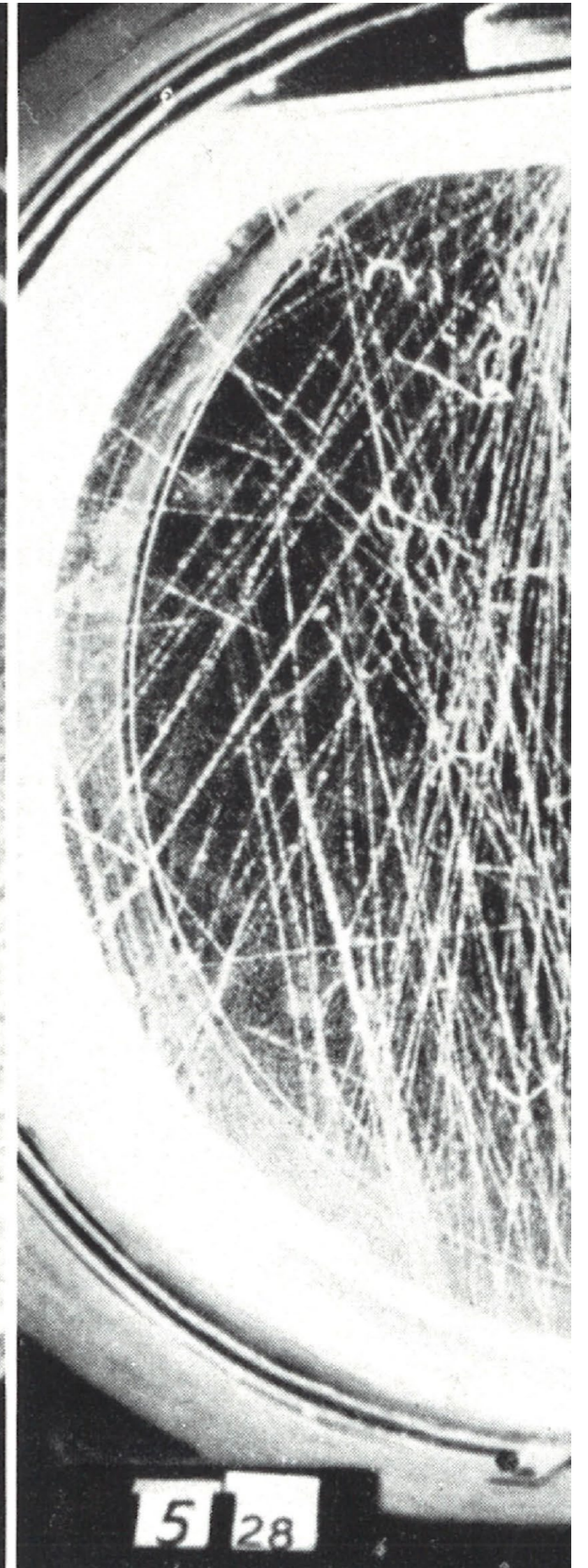
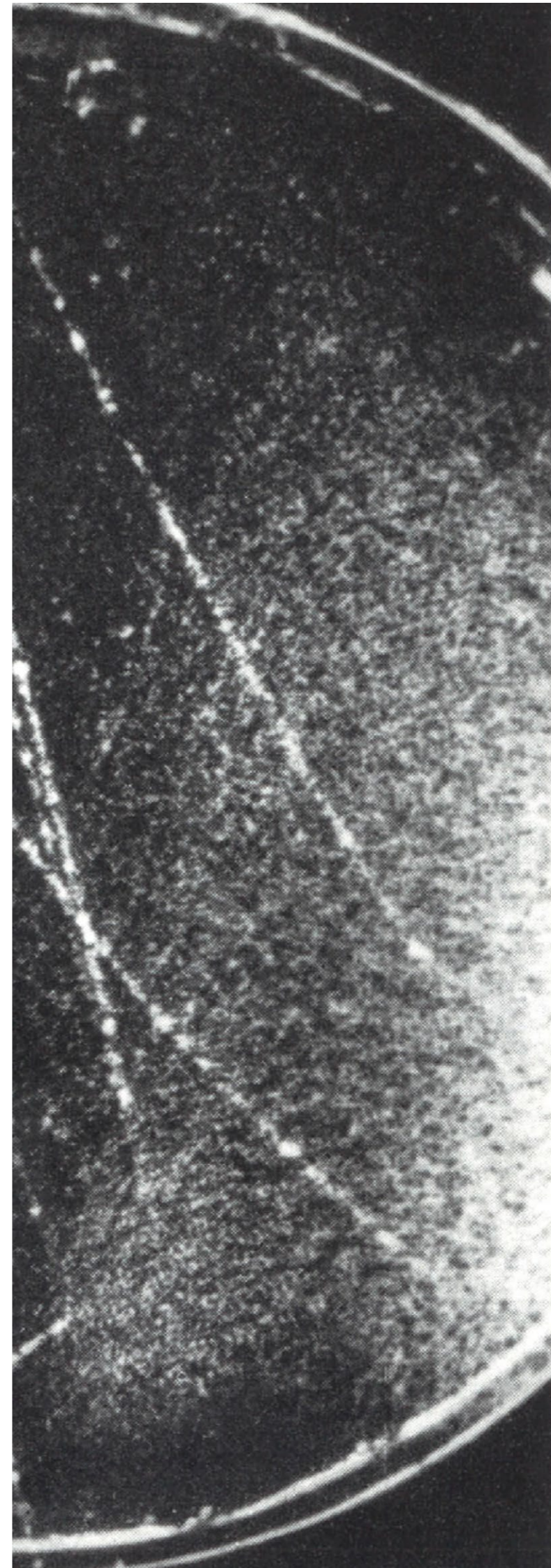
We constantly find ourselves wrecked upon the pluralist stance, which insists upon a strict hierarchy of Wholes and their independent Parts, and the true nature of a holist Reality just never comes up.

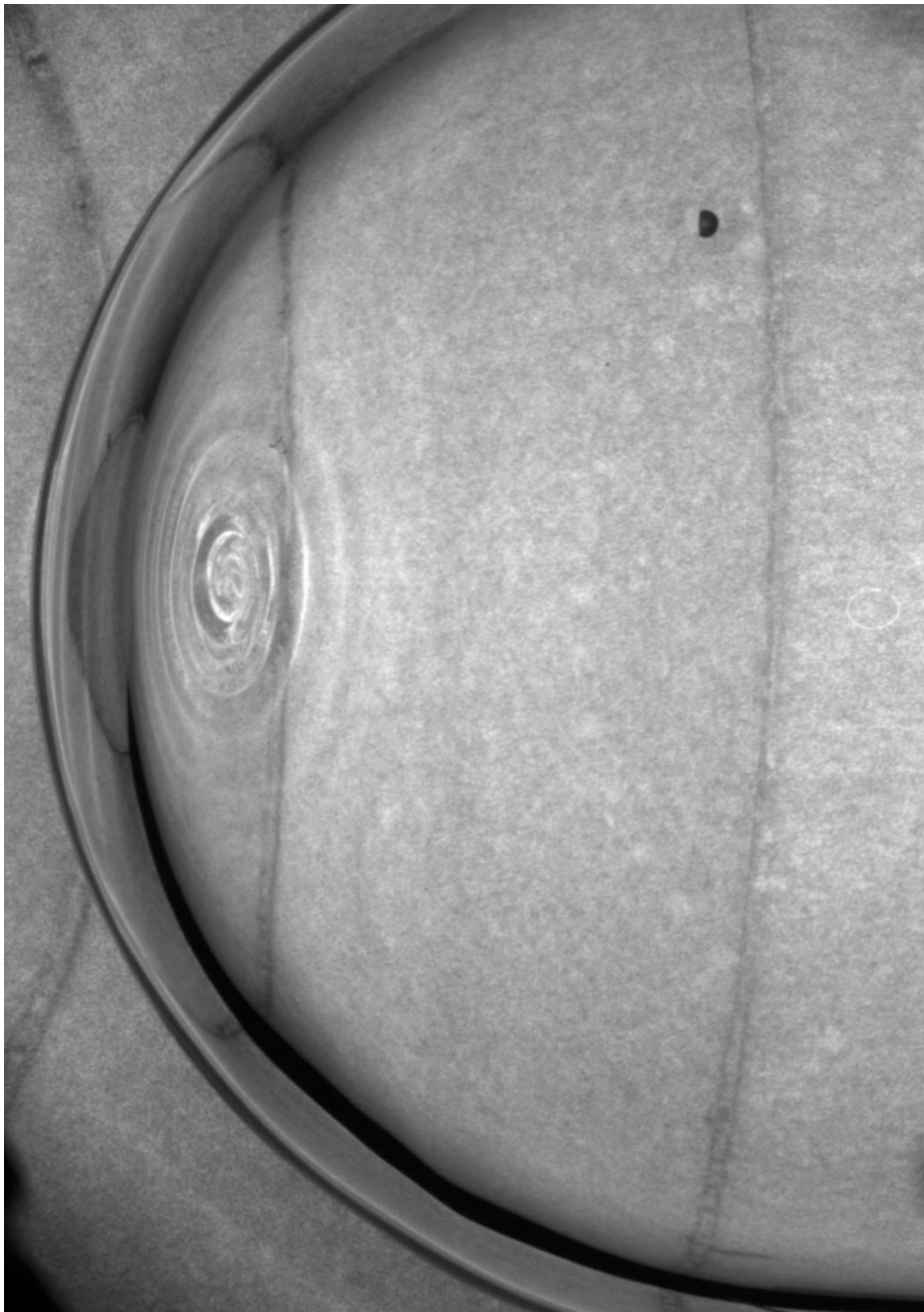
Now, of course, all this is speculation! What else could it be? We most certainly can have absolutely no access to layer upon layer of processes, which came-and-went long before investigating Man even arrived on the scene!

But, an upwards and downwards extrapolation of the very same properties as exist now, is, surely, just as far fetched?

To be consistent and thoughtful holists, we must, as Hegel insisted, address impasses of opposites as being always due to incorrect premises, and break fundamentally from our prior simplifying and idealising pluralist constructs, which have apparently served us well so far, and with previous experience of doing this in various individual studies, attempt to surmise what could be the case via such unavoidable extrapolations too.

Clearly, the constant seeking for still-existing fundamental elements and processes, poses the crucial question, “Why aren't these same creation processes still happening, and hence observable, now?”





They aren't, of course, and you have to ask, "Why?"

A more realistic task must, surely, be to always seek a lower premise cause for our supposed "primitives"! Changes must be assumed to go "all the way down", or, at the very least, beyond our current set of elementary particles.

But NOTE: This doesn't at all mean that our current policy of particle smashing is the way forward, for it is just as likely to be creating new forms, rather than revealing our supposed prior forms!

So, in tackling this problem, at the current bottommost level, it is essential that we look for prior situations that led to a found Stability.

Clearly, the best we can do is to use already found traverses of *impasses* as a sort of model, and go from there! Clearly, such "primary" (backwards) *impasses* are profusely evident in all our separate Sciences, which we have never cracked as causal developments in themselves, and instead jump from one level (science) to another, without any certainly-needed explanation.

Obviously, such Emergences do not usually get addressed.

So, it is, by now, very clear that the serious study of *Revolutionary Interludes*, must be imperative, both generally, and also as we seek to delve ever deeper into the long, remarkably-creative development of Reality - particularly in its long gone, but crucial, "revolutions! The Origin of Life is just such an Emergence, but also we have to attempt to reconstruct much earlier developments, such as we are considering here.

And, let's face it, if we cannot speculate to suggest solutions to these relatively simple emergent properties, what chance will we have with dealing with The Origin of Life or that of Consciousness

But, how can we, experimentally, investigate such things? What is absolutely certain, is that High Speed Accelerators (Colliders) are most likely to be *creating* (rather than revealing) purely fragmentary and hence temporary "new things", and absolutely certainly NEVER establishing new persisting Stabilities, which must have been Nature's Development Path!

Perhaps, Yves Couder, the French physicist, is pointing the way with his remarkable excursions into re-creating (at a higher level) , processes which occurred at a prior, and now unavailable sub atomic level. The whole approach was both unique and ambitious, but has revealed important processes, which certainly have never been displayed in all the usual pluralistic experiments that are the usual ways of conducting experiments.

Couder stripped down his components and kit, until all he had left was a single substrate - a silicone oil, and absolutely nothing else!

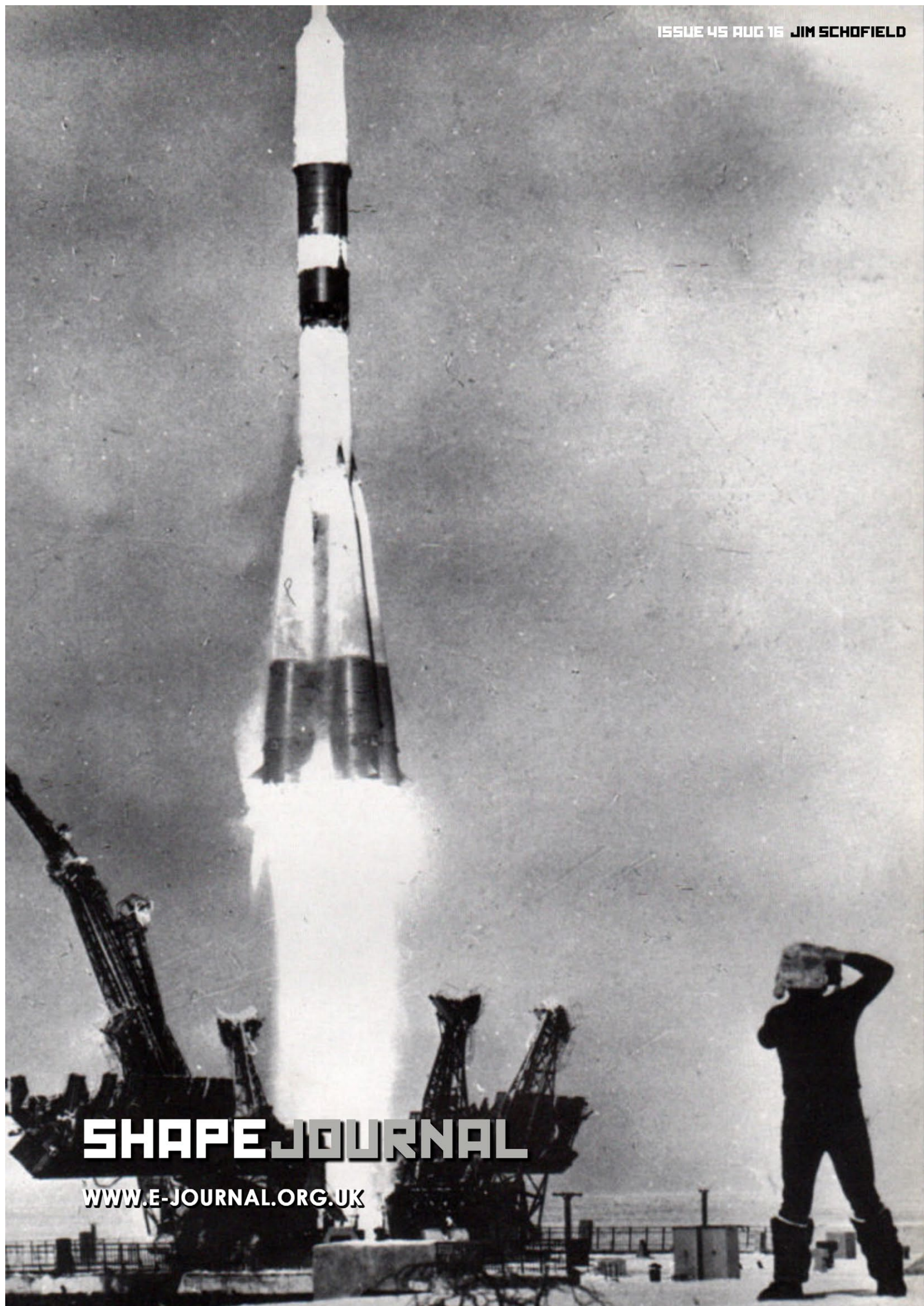
Clearly, no-one else would do such a thing, because, "What could you possibly achieve with that meagre apparatus?"

Well, Couder decided he could introduce only Energy! He wanted to investigate, at a completely visible macro level, processes which occur at the invisible micro level within the Atom. His one concession to a component was his silicone oil substrate: he was going to see what he could conjure up using only such a Substrate and Energy! The details are available on the Web, both from Couder himself, and from the writer of this paper, so I will not replicate that here.

But, what must be revealed is that he produced persisting stable entities consisting only of silicone oil, which he called Walkers. The key achievement was when he got his Walkers to perform quantized orbits in a directly analogous way to those performed by electrons within the atom.

His specific method is not generally applicable, of course, but this holistic stance certainly is!

We have to, in a higher visible level, attempt to replicate, analogistically, what first occurred eons ago at an ancient and much lower level.



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