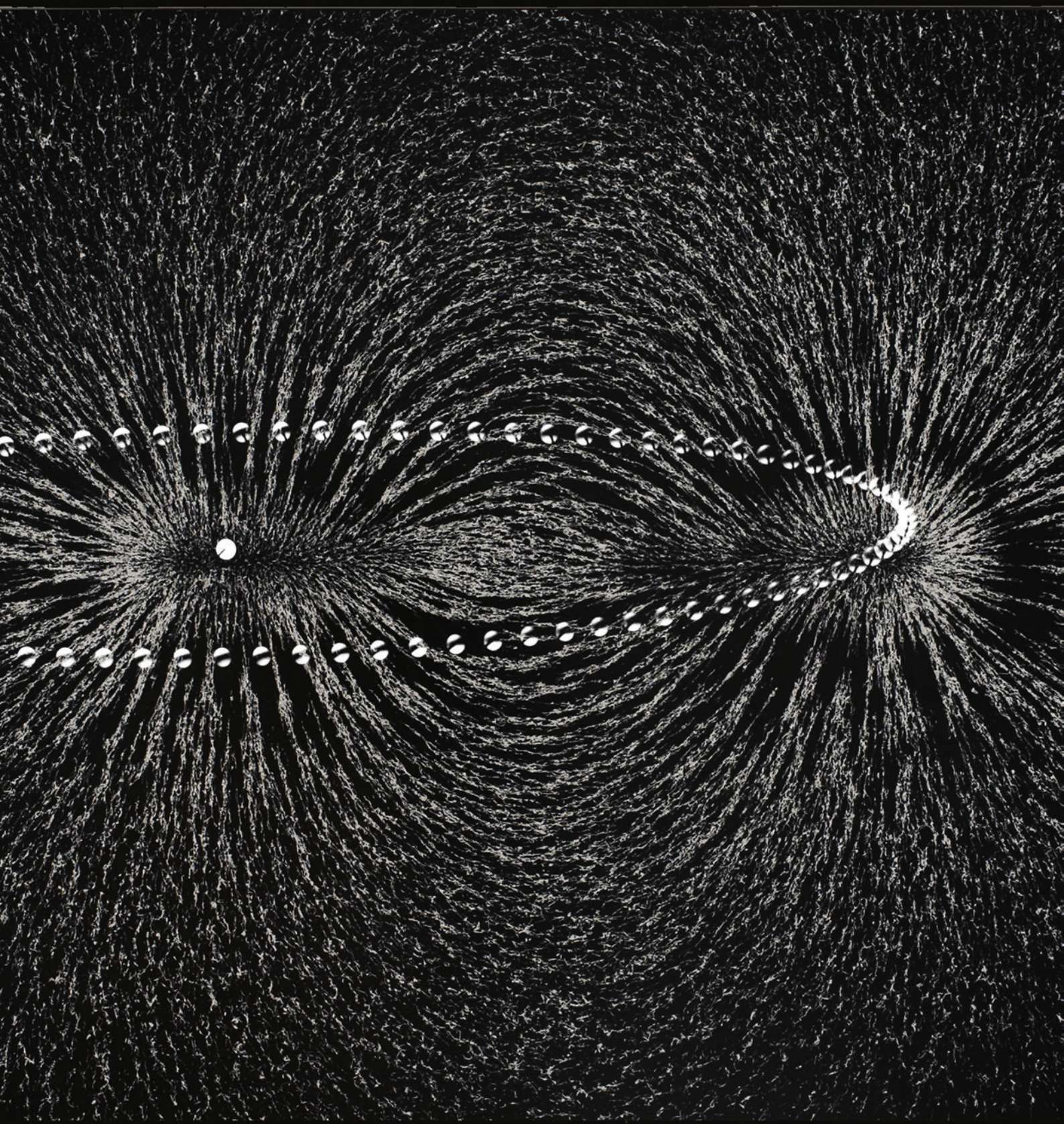
SPECIAL ISSUE 37 JULY 15 JIM SCHOFIELD



SHAPE JOURNAL

THE ATOM
THE ATOM AND THE SUBSTRATE - PART 2

NON-COPENHAGEN EXPLANATIONS / QUANTIZATION OF ORBITS / FIELDS / THE VORTEX

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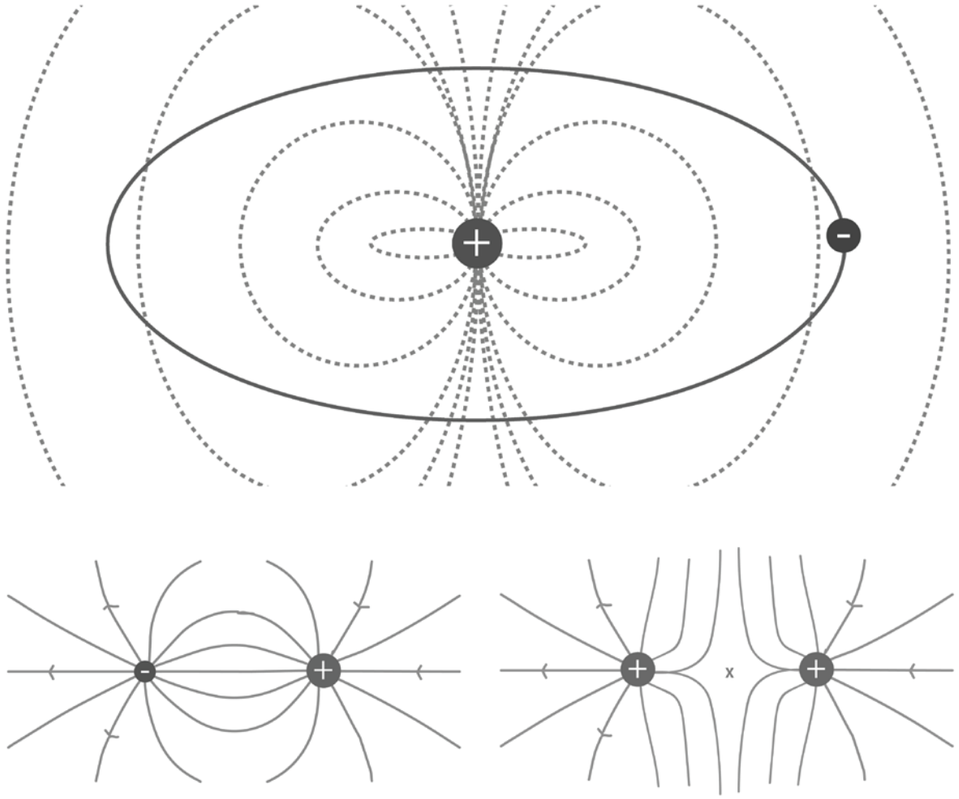
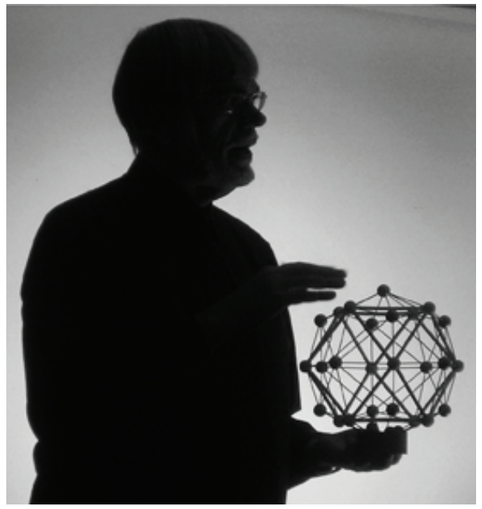


Special Issue 37

The Atom

The Atom & the Substrate (Part II)

Introduction: the non-copenhagen atom



Welcome to the 37th Special Issue of the **SHAPE Journal** and the second in a landmark series outlining an entirely new approach to Sub-Atomic Physics.

Clearly, if we are to seriously consider the presence of a Universal Substrate (like the now discarded Ether, but of a concrete composition), which is nevertheless undetectable by the usually applied means, we also have to address the dominating emptiness which, using all the current models, exists within the atom.

For, taking the known sizes of even the simplest atom's components, and their distances apart, it would be hard to exclude any general substrate from filling those spaces too.

Now, if the consequence of such a substrate, outside of all the "material components", was a major rethink, then the situation within atoms will certainly be even more demanding of a full explanatory account.

Indeed, the current Copenhagen Interpretation of Quantum Theory is definitely NOT a physical description, never mind a physical explanation of phenomena in that realm, but, on the contrary, only a probabilistic description – involving only formal, abstracted elements, supported by a great deal of unsupported speculation.

Now, in this theorist's treatment of the famed Double Slit Experiments, it was merely the presence of a Universal Substrate, which enabled an adequate, coherent and comprehensive explanation of all the confusing phenomena occurring there.

Thus, as we switch to the Sub Atomic Realm, we simply must consider all the effects that would be caused by the presence of that same substrate, on all phenomena occurring inside the atom too.

So, this Special Issue of SHAPE Journal has as its remit the physical explanation of those phenomena – including, of course, the quantization of the orbits of contained electrons, and the presence of caused vortices in that substrate, which transform exactly how such phenomena are caused and inter-related to one another.

ENJOY!

Jim Schofield
June 2015

acknowledgments

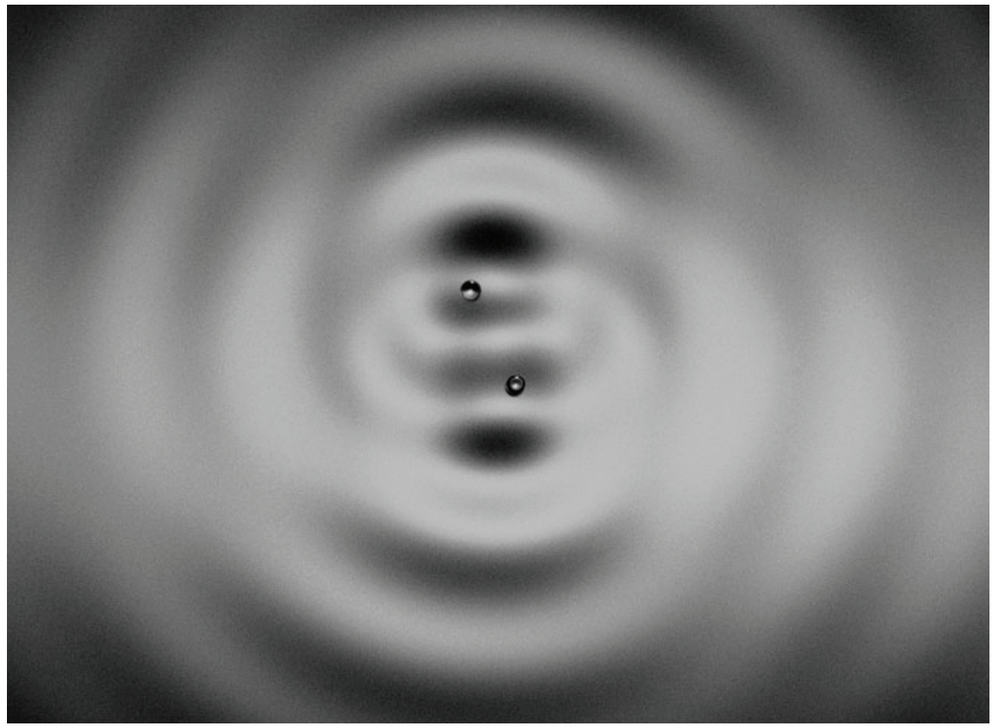
I would like to express my admiration and gratitude for several theorists and physicists, whose prior invesigations helped lead me to these new ideas, and without which this theory of quantisation in atoms would not have been possible.

Yves Couder
Couder's crucial experiments with silicone liquid revealed quantum-style behaviour in the macro world, including quantised orbits - but everyone missed the elephant in the room! Couder's silicone bath was an analogue for a univeral substrate.

Glenn Borchardt
Borchardt's work on false assumptions in Physics and the problems of action-at-a-distance lead him to see gravity as a push force. See Neomechanical Gravitation Theory and a universal substrate of "heterogeneous distributions of aether particles throughout the universe."

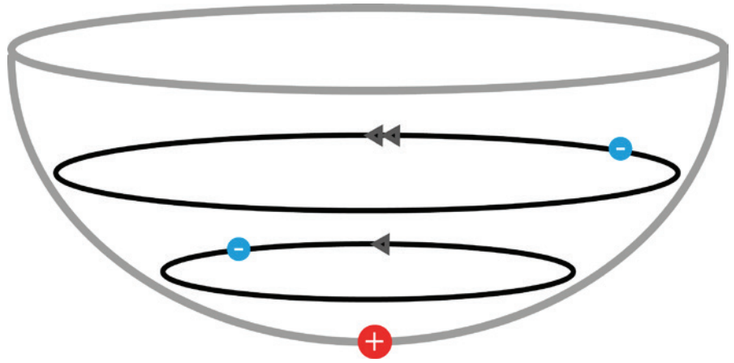
Mohan Tambe
Tambe's recent work on a theoretical substrate that delivers both magnetic and electrical fields in "empty" space provided an important part of the particle puzzle.

David Bohm
Bohm was a great theoretical physicist who rejected the Copenhagen view and instead claimed the answers lay in hidden levels of reality below the atomic.



Rayographs by Man Ray (1922)

Using Couder
to explain the atom



This is an initial muse upon an alternative explanation of quantization. The illustrated "Bowl Model" of the Atom, is used analogistically to try to get an initial handle upon the electron orbits within an atom.

We would originally have only a Base Orbit, involving a certain amount of energy, but intrinsic to the stable structure of the atom, and, therefore, not available unless the atom was totally dissociated in some way (ionisation?). Then any extra energy, inserted into that orbit, would move it up the inside of the bowl, until, if it was too much, the electron would be raised above the rim and escape.

Now, it may seem to be a pointless exercise, until we consider what physical causes might deliver such a bowl, and how these constraints also limit the possible orbits to fixed (quantized) levels.

Of course, the real situation within the atom cannot be as illustrated, as all the possible orbits will centre upon the resident atomic nucleus, so it must not be taken too literally. It is merely a starting point, but immediately delivers NO hint of why the orbits should be quantized.

Immediately, of course, with our steadfast subscription to the necessary presence of a universal substrate, we have to consider that such a "bowl" too, is full of that substrate, and we will have to be investigating the unavoidable interactions, between our electron and that substrate, to attempt to explain its unusual properties.

Now, there is something of an important clue: the travelling electron does not leak away energy as it ploughs through this substrate! Such interactions will certainly involve some transfers from the electron to the substrate, but clearly, with our "No Leaking" imperative, that energy cannot be lost to the atom, or even to that orbit ultimately.

It is almost as if any disturbance of that "internal" substrate is somehow "kept-within" the atom's boundaries, and even returned to the electron to maintains its orbit.

Yet, even if this were true, it couldn't be a permanent imperative, for extra energy taken into the atom will certainly promote its orbit, to another higher, quantized level (so that will also have to be tackled). But, for the moment let us concentrate upon why disturbance energy in the substrate does not escape, and is, somehow, paid-back to the orbiting electron.

Now, the usual paradigms will certainly NOT help us here.

Classical physicists tried for decades to explain these features of the atom, and in the end gave up – abandoning all explanatory theories, and retreating into a realm governed only by abstract formal relations. They called it The Copenhagen Interpretation of Quantum Theory, and it was a significant philosophical retreat back to idealism.

This theorist has long rejected that move, and gradually realised that the whole classical stance and methodology of Science had long ago settled for mechanistic explanations, coupled with idealistic driving equations, to cope with their abandonment of qualitative change in their theories. They found in nature (or much more commonly fabricated) stable situations in which this approach could be, pragmatically at least, highly successful.

It most certainly worked technologically, but always failed when it came to explaining the development and evolution of reality. For these were considered as fixed! They took their task as the revelation of the eternal natural laws that made reality what it was.

So, being a biologist as well as a physicist, I went to that supposedly physically determined and "secondary" science, to find an alternative stance. And, I found that it was not only evident, but was known and well used by a relatively small group (who used it elsewhere). Indeed, studies in such things led this theorist to produce *The Theory of Emergences*, a means to deal with qualitative change. He had spent a great deal of time on the Origin of Life, and in Social Revolutions, so he was able, finally, to devise a trajectory of the changes that occurred in so-called Emergent Interludes.

He decided that such an approach was entirely appropriate to address this current momentous and debilitating Crisis in Physics. From that work, he got the following ideas. You have to see Reality as an alternation between (often long) periods of Stability (where our scientific methods work well), and short interludes of major upheaval, Emergences (where all truly qualitative development occurs).

Then, when the electron in a maintained, quantized orbit is affected by an influx of energy, if the amount is too little to raise the orbit to a higher, quantized level, it would have NO effect, and the energy would not be absorbed.

But, if the delivered energy were above that threshold, a transition to a higher level would indeed occur.

BUT, is that a small thing, explained easily by some formal mechanism? Clearly, the answer has to be "NO" to both surmises!

We have, first, to restate what happens to accommodate the emergent phase that would have to be involved in such a transition.

It would be a qualitative transformation. It could never be like the throwing of a switch.

Not only has the electron to be moved to a different orbit, but also this new orbit will NOT be stable as was its original base orbit. For, at the first chance a quantum of a particular frequency, electromagnetic energy, which will, somehow, escape, and the promoted orbit will return, in the simplest case, to its stable base.

Now, our task, at present has, at least, to be to attempt to involve Yves Couder's discoveries from his famed "Walker" experiments, and, by this means, to attempt to explain what is really happening in the Atom.

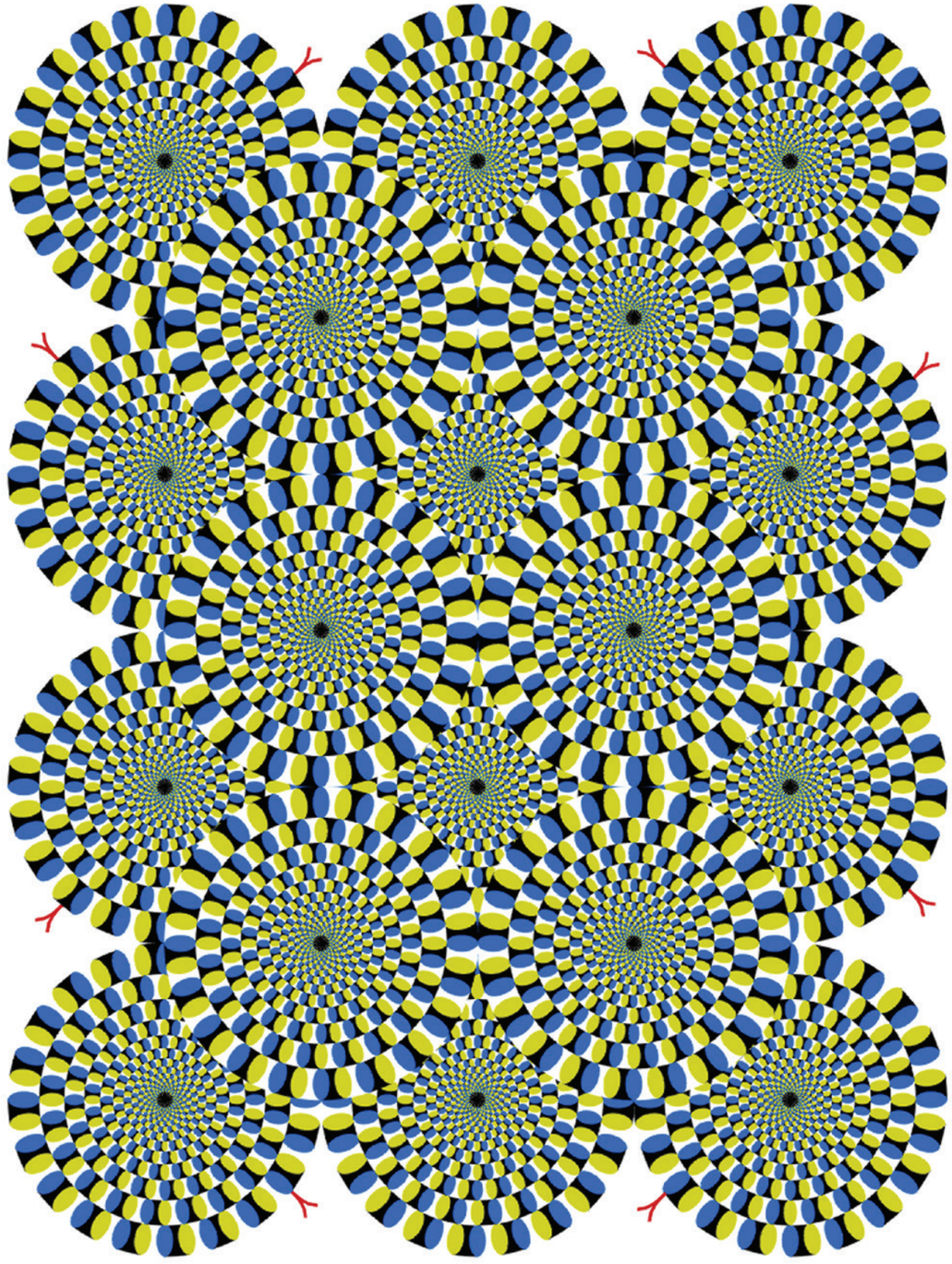
Two aspects are crucial.

First, why is a certain orbit stable, while others are not? And, second, what actually determines the series of possible orbits (and associated energies) that can be achieved?

Now, the absolutely crucial addition to Couder's set ups was that of an imposed, overall rotation. Prior to that addition, he still achieved stable "Walker" entities, entirely out of just a substrate and interacting oscillations. So, the stability aspect was already happening, even before the rotation was added. Then, with that seemingly simple addition, the Walkers, as entities in themselves, took up only specific orbits. They had been *quantized*!

Thus, our separation of the Stability and the quantization appears to be valid. It seems that we can consider Stability in terms of oscillations alone, and it is the rotation that allows the extra feature we term quantization.

NOTE: At this point, it must be emphasized that the usual modern day physicist (read mathematician) studies his detailed data to attempt to "fit-a-form" to them, and



considers that once this has been achieved, the important work has already been done. But, I, as a physicist, have to strongly disagree! What has been done is to very clearly only *describe* what is happening in purely formal terms. It does NOT explain why that is so. I'm afraid the "explanation" – "obeys this law", is wholly inadequate: that explains nothing.

Now, I admit, the various parts of Couder's experiments have been rather vaguely put down to resonances, and their later recursions, but though I am sure that these are indeed part of the explanation, we still have to also explain the particular effect that a rotation adds to the system But, what can be asserted with certainty is that Couder's macro experiments will require no references to the Copenhagen Interpretation of Quantum Theory to explain their results.

What Couder achieved was quantization without Copenhagen!

Now, it isn't quite like our electron rotation in the atom, for Couder rotated his whole set up. If we tried to apply it to the atom, it would be like rotating the whole atom – which could only be a Spin! The confusion occurs because the ONLY known rotation in the atom is that of the orbiting electron. Yet, we know that it has been necessary, formally, to consider that the electron can spin (or perform something similar). BUT, it turns out that that spin is also quantized into just two possible states. So, though direct analogies are not possible, there is certainly enough positive links for this undertaking to be pursued.

Clearly, and as always, the case of how we think about things, comes into this too. For, we impose simplified and idealised "rules" upon our measured situations, always expecting to find some Formal Rule that will fit it. We do this, to attempt to make sense of the measurements we have, and, in so doing, expect to get usable formulae to enable us the predict and produce via what we have extracted. And, we are probably doing it here too, even with the Copenhagen Interpretation.

Let us, therefore, do a quick review of what might be happening within the atom

First, there is an orbiting electron.
That electron may also take "spin".
The nucleus also orbits though in a tiny circuit.
The nucleus may also "spin"
The atom, as a whole may "spin" too.

Now, this possible collection of rotations is a bit intimidating, but even these may not include all the possibilities. There well might be oscillations too.

It seems that to be in a position to crack these problems Couder may yet have more experiments to devise and carry out!

Atoms in a Universal Substrate
vortices maintaining electron orbits?

The usual occurrences of vortices are where there is an energetic flow constrained within an otherwise relatively still medium. For, that flow naturally disturbs the quiescence of the medium by the production of vortices along the sides of the causing stream. With a continuing flow, these vortices are fed with energy taken from the flow. But, if the causing flow is somehow removed, the vortices remain, and for a short time recursively re-form the flow in a somewhat lesser way.

This will deliver a temporary following "Ghost" of the original cause.

But, consider a situation where the "causing flow" can regularly stop and start, and following the very same path, the recommenced initiator will, therefore, most certainly encounter the "left-behind" vortices. The question is, "What might happen then?"

Well, actually, we know the answer very well from a wide variety of well-known occurrences in sport.

What will happen is that there will be an added forward force from the now detached vortices onto this re-installed flow. It happens all the time in all sorts of races, for example, though usually with descrete entities or participants.

But, the case I am considering is to do with the electron orbit within an atom.

NOTE: Notice that there will be no Copenhagen *mysteries* here!

For. We are assuming that this takes place within a universal substrate that "paves" all space, including "within" an atom. This means that the moving electron will be ploughing through this substrate, and will, thereafter, be returning regularly along the very same path. Thus, on each return to any given point, on the orbit, it will definitely encounter the vortex it produced on its previous passages through this point.

Indeed, the very same will occur for every single vortex-point around the whole orbit. All disturbances, in vortex form, will be encountered again, all round the orbit, and for every succeeding pass too.

It seems likely that detached vortices will deliver energy back to the electron via the usual "ghost recreation" of the original cause. What seemed to be totally lost, will, to some extent, be re-cooped, and on every following orbit too.

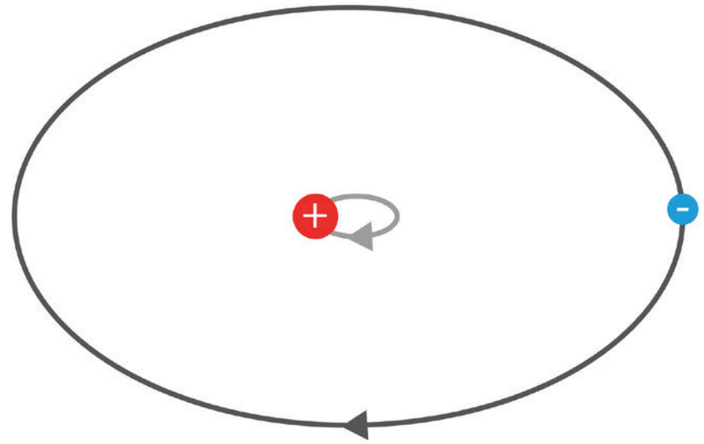
The big question is, "Could this mechanism, in some way, maintain the electron orbit without any losses?"

NOTE: The answer to this question is also both posed, and answered in Yves Couder's brilliant experiment, which produced stable entities, which he termed "Walkers", purely out of a substrate and resonant and recursive effects via a set of vibrations. This is because the crucial repeated return of the initiating "bouncing drop" did, in fact, create a stable entity, with NO losses to the ever-present substrate. The recurrence of the drop at the right rate locked a triple-vibratory-system into a stable form, and what was crucial there was the additional constant supply of energy from a purposely, vertically vibrating substrate.

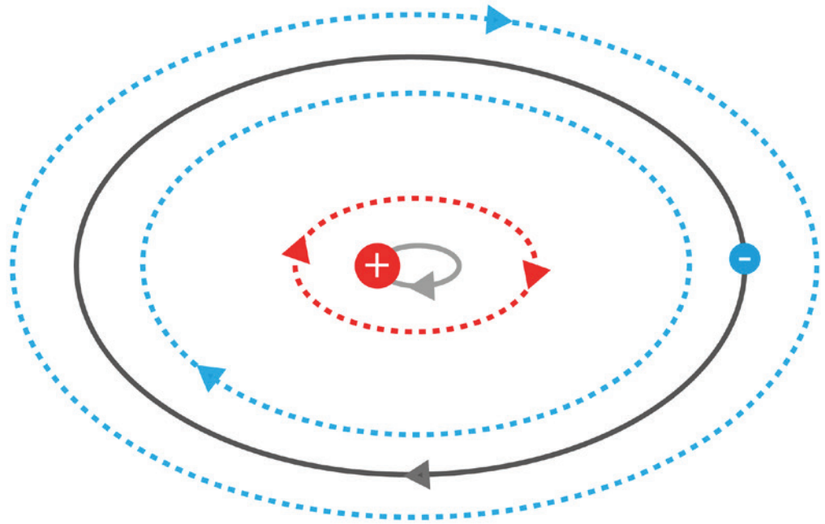
Now, this is the exact opposite of what you might expect! With a universal substrate, you would immediately expect that any disturbances caused to that substrate would be communicated *away* from their cause and hence, irretrievably lost to the causing system. You would expect the very same running-down that you would certainly get from an electron traversing that substrate in a straight line. After all there is absolutely nothing in the way! But, here we are confidently suggesting the very opposite.

So, the question has to be, "In the context of within-the-atom. could this be true?" It might require some other as yet unstated feature, but also the constant return to each and every point on the orbit, AND their associated vortices, with everything happening at a very high

ATOM & SUBSTRATE



Disturbances within the Atom's substrate.



frequency would certainly minimise any initial losses. The question still to be answered completely is, “Exactly how could this be achieved?”

Indeed, if we stick to thinking only of a very first return, this conception will, most certainly, not hold up. There will, indeed, be unavoidable initial losses!

So, if, instead, we follow the whole trajectory from a totally separate nucleus and electron (and using the simplest case of Hydrogen), and starting with the capture of the electron, the losses will still occur, for at this stage it is still an electron travelling through a substrate. And, this will continue UNTIL the repeating regime gets established. Now, the establishment will actually require some energy losses, for (as we will show in a following paper) the speed of the electron and of the caused vortices will only settle into stability, IF they are “appropriately related” (they *resonate*), each time they meet again. Then, and only then could the stability possibly be locked in!

It is clear that at least one of the necessary conditions must be for these relations to be happening. We are getting very close to quantized orbits – but not yet!

It should be made absolutely clear that to solve the problem, both for Couder’s Walkers and the electrons in the atom, an alternative philosophical stance is absolutely imperative. Instead of the universally accepted Principle of Plurality, there will have to be a switch to the much more closer-to-Reality Principle of Holism.

Indeed, the credo “Everything affects everything else” will be crucial. The now long established pluralist concepts and methods, which have been universally adopted for centuries, will require to be replaced by an approach which consistently addresses qualitative changes, AND, even more important the interludes of major, even revolutionary changes, which are termed Emergences.

Clearly, in this realm within the atom, the usual stance cannot cope. The transforming processes including resonances and even recursion cannot be simplified in the old ways. The real losses of energy by the orbiting electron, will be countered, and ultimately balanced by recursion from produced vortices, and from exterior sources within a universal substrate, to actually make such orbits losing NO energy and being resolutely stable.

The Vortex
implications of a universal substrate

What seems to be a universal phenomenon is The Vortex. Such disturbances happen in media such as water and air, and hence occur all the time in the Earth's weather, as well as the truly amazing turmoil that occurs in the atmosphere of the giant planet Jupiter.

NOTE: The remarkable thing about these disturbances in Jupiter's atmosphere, is the long-lasting stability of many features – such as the Great Red Spot. And when the spacecraft fly-pasts, such as those of NASA, took place, they were able to take sequences of images, which could then be made into moving animations, delivering the most interesting extra feature, which is surely the relatively swift movements of flows around these relatively permanent and static stable areas. As always, we should take Reality as our very best source of sound analogies when addressing features elsewhere.

I am being strongly attracted to possible occurrences of vortices at the sub atomic level, for that also means within atoms too.

But, of course, you cannot get vortices in totally empty space: you need some kind of amenable substrate to deliver them.

As James Clerk Maxwell so brilliantly demonstrated, in his suggested model for The Ether – then considered as filling all of Spacec – Vortices could be components in what he saw as a heterogeneous universal medium.

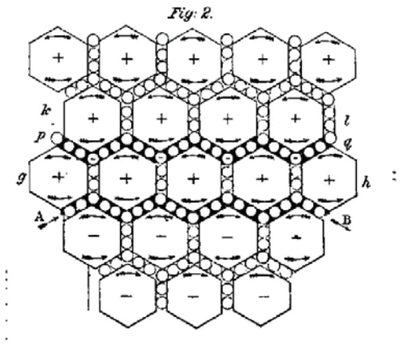
NOTE: At this point, the unceremonious dumping of the Ether when it couldn't be located, tells us a great deal about the major flaws in Science. For, in place of this concept, they decided to replace it with absolutely Nothing! The clear and evident physical problems of "so called Empty Space" were just shelved, and mathematical forms, which delivered useable methods, were considered sufficient. They just aren't! There was more Objective Content even in The Ether than in NOTHING!

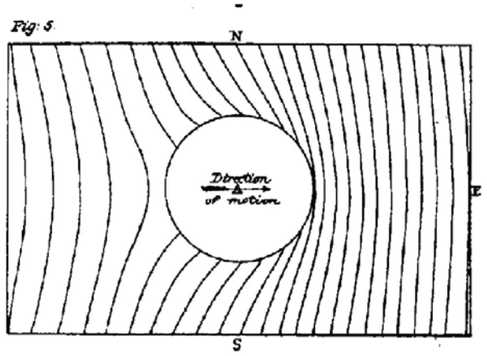
For, Maxwell's vortices (as shown below) were one part of that medium, which also included his "electrical particles". And, as you can see, these clearly flow around the vortices in a very comparable way to what happens on Jupiter. And, in this model, these two elements, together, gave the ether an unusual nature - for they worked together.

The "electrical particles" were constantly on the move in "streams", around the relatively-static, and persisting vortices.

Indeed, it is likely that the vortices were composed of many of one kind of component that were actually affected by the surrounding flows. It is similar to a static situation being affected by incoming energetic streams.

The relatively static forms could be set into rotation, and a kind of temporary stability could result.





PREVIOUS: Ohne Titel (Rotor-Relief-Scheibe) by Heinz Mack (1931)
THIS PAGE: Descension by Anish Kapoor (2015) - A never ending Vortex

Something similar is what might be happening in atmosphere – because the energy of streams of movement sets whole areas of air into rotation.

Now, of course, any direct one-to-one mappings of one example of a vortex with another, in a very different context, are not usually possible - for a wide variety of reasons. For example, the third dimension is most certainly involved in the weather, whereas such entities in a still pond, disturbed by an incoming stream is mostly a surface phenomenon.

In addition, the passage of a particle through a substrate, though also likely to produce similar vortices, will immediately exit the area and leave the vortices behind, without further energy inputs into them.

NOTE: In Yves Couder's famous "Walker" Experiments, using only silicone oil, the disturbance caused by a bouncing drop, of the very same oil, caused a surface standing wave, and the resonant connections between the (at least three) frequencies involved along with a recursion, finally creating a stable "walker" entity out of merely vibrations in a medium and nothing else!

The study of vortices initiated by Lorentz work upon Turbulence – when taken over by mathematicians, was converted (ultimately) into what they saw as a purely formal state, and hence merely a branch of their discipline, which they termed Mathematical Chaos.

Now, there certainly are connections, but Turbulences of these sorts are never merely mathematical forms.

NOTE: For, the truly physical nature of situations involving such flows and vortices, when thought about in terms of the physical features present, rather then merely formally, are likely to throw much more light upon what is actually happening, than just the Pure Forms connected with Mathematical Chaos.

One key technique, which I was required to use, when I was helping the excellent mathematician Jagan Gomatam (in his cutting edge work in this area), was the use of Iterative Techniques. Now, these originally had been developed to arrive at solutions to particularly difficult equations, by a method, which homed in upon its target by using successive approximations to get ever closer.

But, when used the way that I was asked to do it, it was far from that objective. What was being required to be done was the production of a pattern of possibilities (a State Diagram) by using restricted relations and a generated sequence of points – each one derived from an earlier one on the diagram. And this pushed the produced patterns, sometimes, well away from those achieved directly by plotting the normally used equation.

I am pressed into thinking about situations, which could be seen, as simply as possible via pure, formal relations, OR could alternativrly be investigated iteratively, with each succeeding derived point found by the iterative form, to get the next. It doesn't mean that chaotic mathematics or iterative forms ARE the laws of such situations, but that they reflect the real situations better. They are also NOT the Truth, but indirectly they deliver MORE Objective Content.

What remains the Key Priority is a physical study of these entities. Indeed, the very inexplicable (physical) nature of quantized energy levels within atoms, could be tackled in this way, if an all-pervading substrate is assumed for all of so called Empty Space, even within such entities.

Just as Couder managed to induce quantized orbits of his Walkers, entirely due to oscillation and rotations affecting one another, we have to consider the possibility of the same inside the atom. Though clearly, this will be no straightforward task, as many features, which we would expect a substrate to cause, are in atoms, not only absent, but the exact opposite seems to be the case.

Inside the Atom 1
maxwell's model once more

Let us consider a particularly interesting case, concerning the consequences of a universal substrate. The most intriguing has to be the situation within the atom, for, if all the major spaces inside that entity are filled with our suggested substrate, it will have some unavoidable consequences.

For, we have, right away, the problem of why an atom, with a promoted electron orbit, does not immediately communicate that extra energy to those already present internal elements of the substrate, which fill absolutely all so-called "Empty Space" everywhere?

It doesn't actually do that, so something must cause it to keep the situation at its current stable level, and, therefore, also some significant changes would have to happen to, at a certain point, precipitate its release and communication to that substrate, and hence also beyond the boundaries of the atom, in the form of normal, "in-space" radiation.

What could possibly cause these two cases?

It must be something (like the ambient temperature or something similar) of the context, which not only has the interior units of the substrate, but also those outside the atom, already at such a level internally to more or less "match" the state of the orbiting electron, so that there would be nowhere for the energy to go. If we assume a very natural communication both into and out of the atom, that would work only if the states internally in the atom's electron orbit and internal substrate elements, and externally in the local substrate were not such as to prevent it. So, clearly, if the energy state in the substrate is everywhere lower than the level in the electron orbit, it can be propagated away, while if the energy level in the orbit is lower that the substrate, it can be promoted to an higher orbit.

So, taking the simplest atom to enable a comprehensive start to be begun, we will take Hydrogen – an atom with a single proton orbited around by a single electron.

With the supposition that the electron would be ploughing through the internal substrate, we will have both an effect upon that substrate, and with a continuing cycling through the same path on every orbit.

Now, if this were the same as an electron ploughing through the substrate in open space, we would expect a disturbance of that substrate, but propagated outwards away from the cause, producing a regular loss of energy by the electron.

But, of course, within the atom, these perambulations repeatedly occur without any loss of energy at all, which has to be the case to maintain the exact same orbit, we certainly have to consider the within-atom situation to be special.

NOTE: But, as we have seen in the case of the Double Slit Experiments, when there is a chance of the causing electron later on meeting the result of its previously caused disturbances of the substrate, in a special form – they can reverse-interact, this time of the substrate upon the electron.

Now, if the substrate were stationary, any disturbances would be likely to be propagated out in straight lines from the sources, and hence would be certain to exit from the atom, and unavoidably involve a continual loss of energy. So, that cannot be what happens! Here, instead, there must be some kind of interaction between the substrate and the orbiting electron, which keeps the energy within the atom. What was lost, by the electron to the substrate, must somehow be paid back to the electron within the atom.

It would be that in such a special kind of entity, there are effects upon the substrate by the electron, but also recursive effects back onto the electron by the substrate.

NOTE: Perhaps the standing wave in the Couder "Walker" experiments is the key. For, there disturbances caused by the falling drop of silicone, interact with the oscillations of the provided physical substrate (again the same silicone oil), and to produce such a standing wave around the position of the drop, which, in turn, is then also affected back to make it a continuously bouncing drop. So, in the "Walker" it is a recursive set of resonances and interactions, which produce a persisting, clearly stable entity.

Exactly how this may occur is not yet clear, but in Couder's work there can be no doubt that it does happen.

Two important features may be involved in the atom.

First, the orbiting electron will generate a magnetic effect, perpendicular to the plane of the orbit, and this may affect the substrate, as happens in all Magnetic fields (even in so-called Empty Space).

Secondly, we have the valuable model of James Clerk Maxwell devised for the Ether, and which enabled him to devise his famous Equations of Electromagnetism.

For, in his model, Maxwell had two major components. First, static, but rotating, vortices, and second, actively moving "electrical particles", which move around in the interstices between the vortices. Now, the very fact that this model delivered what it did, gives it at least some Objective Content (some crucial aspect of the truth), and a similar model might allow the known results within the Hydrogen Atom to also occur.

One possible consequence could be that the substrate isn't just a static paving of neutritrons (as was initially assumed), but could also involve other, different particles, that would move, and might even follow the electron around and have effects of their own, especially if they were magnetic!

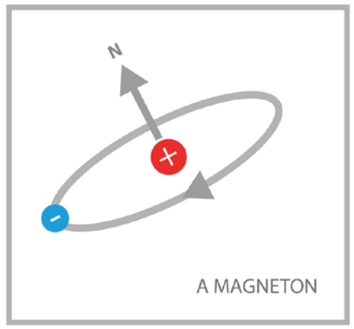
Indeed, when this researcher was attempting to explain electrical fields in "Empty Space", he found that he could never achieve them using only neutritrons alone. And though these had been sufficient to explain all the anomalies of the Double Slit Experiments, they failed to allow any explanation of these fields. The obvious conclusion was that the universal substrate did not have to consist of a set of only a single unit, and he could consider other, different particles, which may figure prominently in things like fields.

The American scientist, Glenn Borchardt, has suggested another component, with which he explains Gravity.

The possibility is that the substrate is *heterogeneous*, and is composed of several different components.

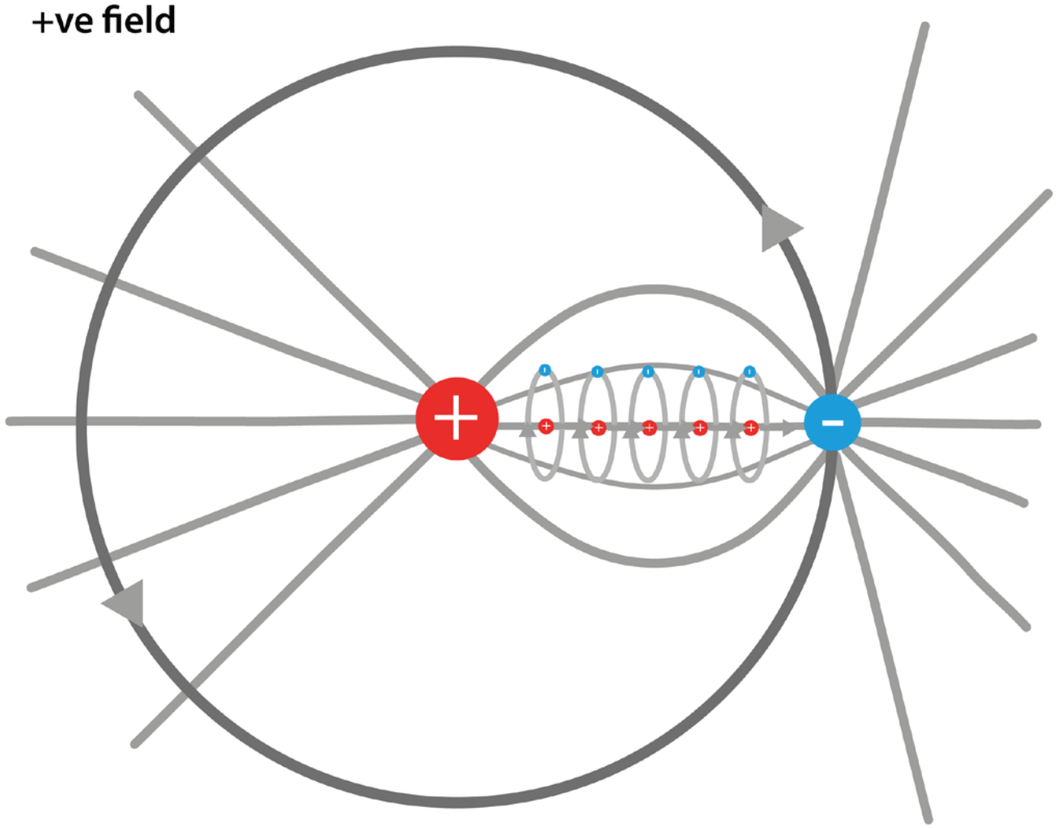
Indeed, Maxwell's discarded Model for the Ether included components so different – namely vortices and "electrical particles", that these formed quite different structures – the vortices were somewhat like my neutritrons (forming a static "Paving"), while the suggested "magnetons" could be loosely mapped onto his "electrical particles".

Finally in this area, Couder's Experiments involving resonant oscillations and recursive effects, which ultimately produced quantized orbits, seem significantly relevant to other well-established features also.



As the electron sweeps round it takes its physical field, composed of magnetons, with it.

+ve field



-ve field

THE ATOM'S ELECTRIC FIELD

Inside the Atom 2
stabilising the electron orbits

Now, we must consider the atom as existing within a universal substrate, which will also be present within the atom, and will include moving "magnetons", which will have the most important effects there, due to their magnetic properties.

But, it must be clearly admitted that the current state of that aspect of the suggested substrate is by no means, as yet, well established, so the points that can be made currently will necessarily be highly speculative.

Now, these ideas indicate that the electrical and magnetic fields that could be subtended, in such a substrate, would indeed require the presence of a second type of substrate particle - termed magnetons.

But, to have substrate particles with the right properties, yet overall, still be undetectable, required that two mirror image types. But, though these are usually arranged, internally, upon a similar basis to the neutritron (that is a mutually-orbiting pair of particles of different matter type). But. With these alternative forms, there would have to be one significantly larger than the other. And, the reason for there being two kinds was that each kind, taken alone, would NOT be neutral in all respects (as was the neutritron), there would be an imbalance in matter types, and the small sub particle would be orbiting the larger sub particle – thus causing a magnetic effect.

A random mix of the two kinds, constantly moving about, would still give, overall, a neutral effect. They would appear undetectable.

Except, of course, if they encountered an electrically-charged particle, for then they would gather around it due to electromagnetic links, forming concentric shells of aligned magnetons, and thus delivering a Field!

So, instead of randomly moving entities, they would, instead, become aligned and relatively statically situated. Now, clearly, if we were to enter this in close proximity to an atom, and even inside it, it must be these magnetons in the substrate, which would be affected.

Especially as, locally, they could interact with the orbiting electrons, and even the nucleus. What complicates the situation is the built-in orbiting of the electron – not only having an electrical charge, but also moving too! NO simple alignment (as with an isolated static field) would suffice here.

Indeed, as these magnetons were purposely, theoretically defined as being constantly on the move, in their normal state, encountering an orbiting charge would indeed be different. These particles would, as usual, try to settle into their normal, field-like state around the electron, but that electron would not only be moving, but doing it in a closed orbit and hence producing a magnetic field too.

NOTE: We must guard against seeing entirely *disembodied* fields. They MUST be a feature of the substrate.

So now, we have to consider how the two mirror image magnetons will react in such a situation?

As the actual field forming substrate, we cannot start with a disembodied "field" affecting these crucial entities. They will be reacting to the close proximity of charges, and forming strings of themselves to deliver field-like effects, BUT now the situation is complicated by the movement of the electron too.

Finally, the atom also includes a positively charged nucleus, itself, gathering a magneton field (this time static), so our magnetons are being aligned in varying patterns, particularly within the electron orbit, The question has to be, "HOW?"

Clearly, we are in entirely new territory here. We may start by some sort of model from the macro world, but it would most certainly NOT reign long!

The most obvious first step would be to compare the situation with a stream entering and passing through a static pond.

For, we know that in that macro example such a situation always causes vortices of spiralling water units, which are created by the effect of the stream on the static water, and then, for a time at least, have sufficient integrity (stability?) to continue, but ultimately decline. It is possible that James Clerk Maxwell, in his Theory of the Ether, had similar ideas, for his analogistic model included both vortices and moving "electrical particles" too. And we must not forget that his assumptions ultimately delivered his famous Electromagnetic Equations. Also, similar forms occur in the atmosphere of the Earth for somewhat different reasons.

But, the usual incessant degrading evident in such macro world cases, where energy is constantly lost, cannot be the case within the atom. For the orbiting electron does NOT leak away energy- it maintains it until the conditions to decant it arrive. No loss of energy due to classical Turbulence is evident at all! In fact, for a period, the arrangement will be stable.

It must be admitted, at this point, that this theoretician has an agenda. He is looking for a micro world equivalent for what Yves Couder managed to achieve in his "Walker" Experiments. For there stable entities were built solely out of a single substrate and a series of oscillations involving what seemed to be both resonances and recursion,

So, let us, for a moment, leave aside the promotion and demotion of these orbits to absorb and deliver quanta of energy – though, of course, that MUST be our ultimate objective. But, what we must first establish is why such an orbits exists without constant energy loss? Why is the atom stable?

It must be impossible for the orbiting electron and the included substrate to fail to interact. They must do so, but in a way, which is self-maintaining by some form of recursion. The fundamental idea, as used in the non-Copenhagen explanation of the Double Slit Experiments, must also pertain here! In other words, affects upon the substrate will occur, but some form of pay-back must also happen, which makes the system self-maintaining. The key question has to be, "HOW?"

Perhaps this pay-back-for-Stability is due to the recurrent returns of the electron to previously affected substrate-ground, by that orbiting particle. For then, it cannot only be the initial cause, but also the later recipient of a caused effect. Then, whatever was left behind by the prior passage of the electron, will then, in turn, affect the electron when it returns.

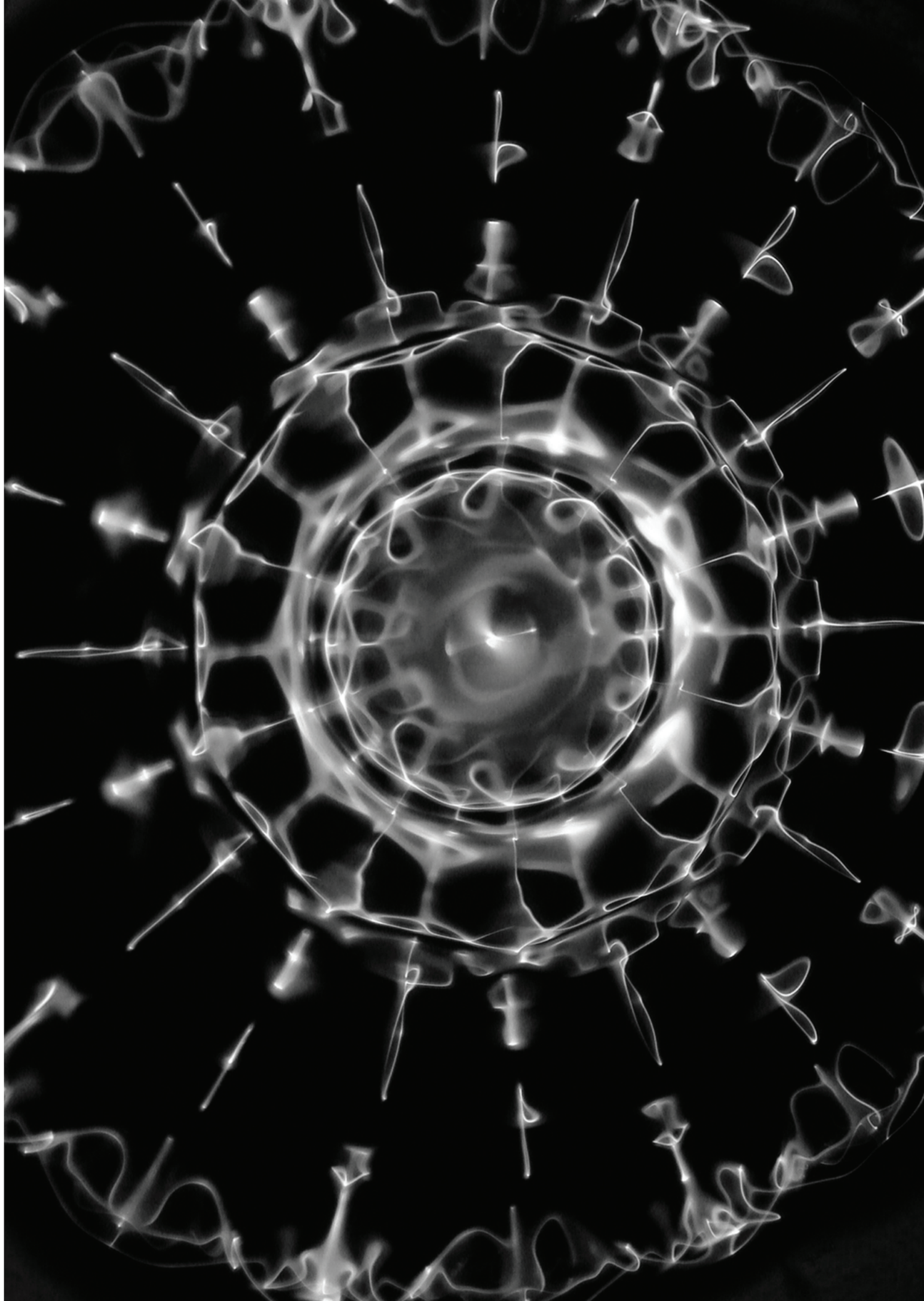
Indeed, it has important resonances with Couder's "Walker" experiments, as the system there finally settled into a stability, once the various parts of the system were working in concert. Here too, once the electron is cycling regularly and causes and effects are in train, the set up is similarly stable! And, of course, this becomes the case for all points in the orbit, so it would surely be multiply re-enforcing of the feedback system.

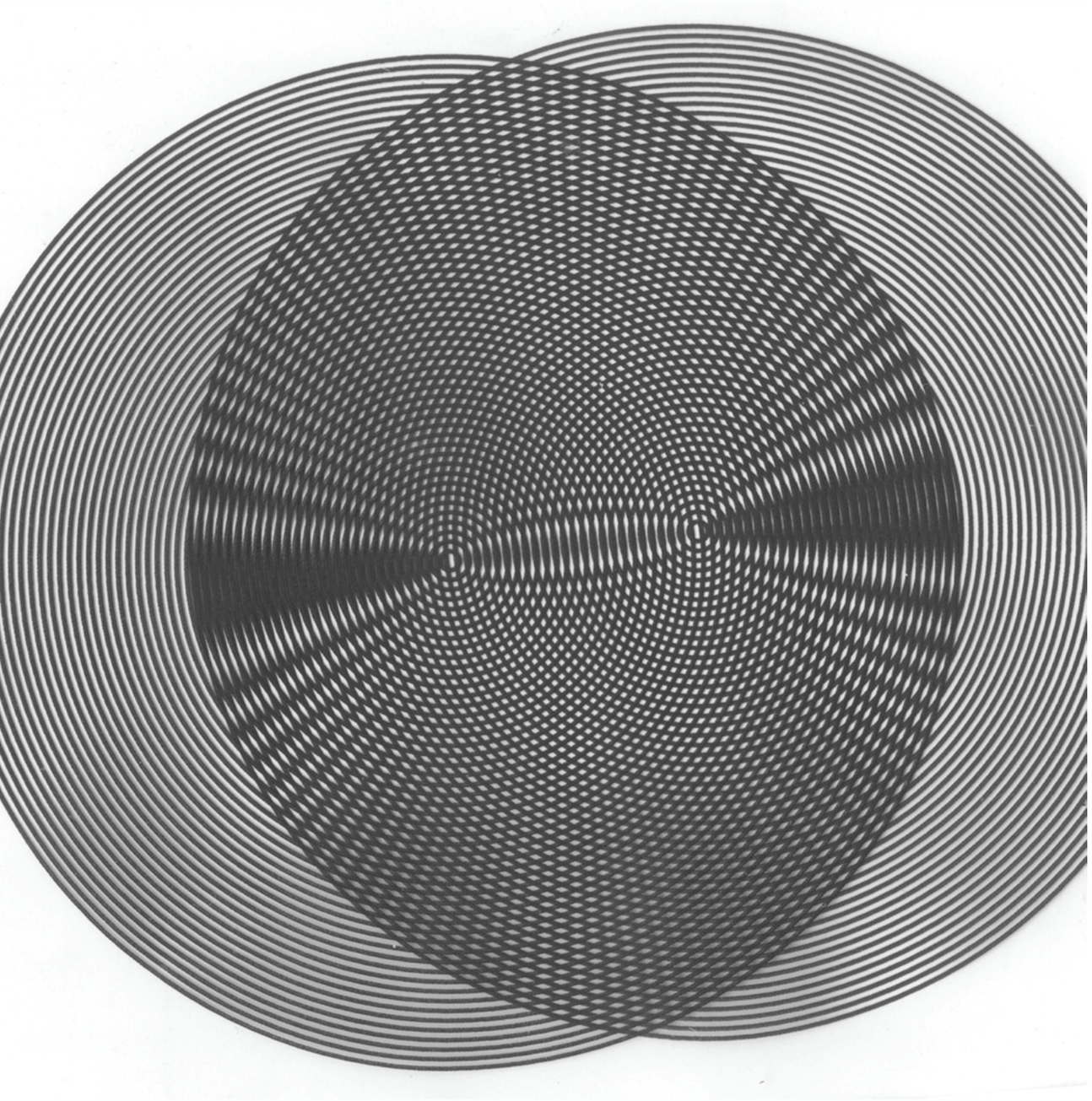
The crucial things that must be revealed are the mechanisms involved. Couder's "Walkers" do seem to offer some sort of answer. For, out of a substrate (silicone oil) and oscillations he managed to produce his stable "Walkers". And, later, with the addition of a rotation to the overall system, he was also able to produce "quantizes orbits" to his Walkers.

The key processes in those experiments were very clearly both resonances and recursion, and the same sort of things could be what is happening within the atom.

Of course, Couder's experiments only worked when the whole set up was constantly vibrated vertically. In other words his substrate provided the energy requirement for the achieved stability. So, if such an analogy is to mean anything in the case of the atom, there must also be such a constant source of energy there too – and that could only be via the universal substrate, in the same way as in Couder's investigations.

But, I submit that this is not too fat fetched! With the sort of substrates previously described by this theorist it would be constantly dealing with energy. And, being a Substrate of Particles, it isn't hard to imagine whole areas sharing energy, and then keeping it if no available slots for the energy to be transferred to were at hand. With such a well nigh infinite substrate, it is clear that it could never totally bereft of energy. It would, in fact, be the greatest store of energy in the Universe.





Quantization within Atoms
why only particular electron orbits are possible

Now, so far, we seem to have explained why the orbit of the electron in an atom does not lose energy to a universally present substrate. But, in fact, that position has not yet been secured: there is still more to be done. It is definitely clear that this stability of orbit only works at certain frequencies, while all others are prohibited. And of course this translates into certain speeds of the allowable orbits.

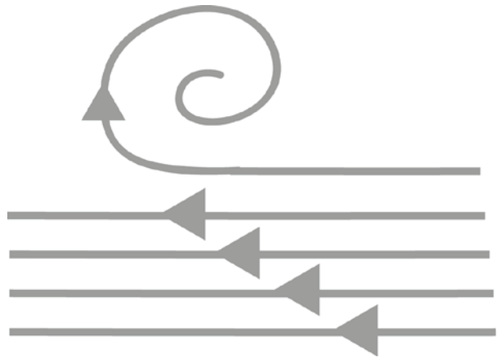
But, what actually achieves this?

To address this, we must answer why the necessary stability can only happen, via some form of feedback, if the speeds are right. Indeed, if they are close but wrong, we should be looking for a mechanism that will lose energy from the electron until it has the exact correct speed, and only then will the mechanisms involved maintain that situation.

It seems most likely that initially losses of energy via the universal substrate will indeed continue, until the electron arrives a one of the necessary “banker speeds”, which terminates those losses, thereafter, and maintains a series of quantized levels only.

Crucially, it has to be the speed of the return, which, in the context of each type of atom, determines what orbits are stable enough not to lose energy continually.

Which Key Frequencies are Quantized?



LEFT: Connected vortex
ABOVE: Disconnected vortex

An important problem when carrying on from previous papers on the topic of vortices is, "What form will a vortex take, when it is no longer driven by an exterior flow?"

Instead of having some sort of area of contact with the causing flow, that will have been terminated, and all that will be left is a circling area of substrate containing energy, without any sort of linkages. It will retain some sort of integrity, but not for long.

In a way, it is an odd sort of gobbet of energy (a pseudo photon?). Yet, on encountering a conducive stream, or moving object, it certainly could either resume its energy-collecting role from such a partner, or even do the opposite!

Now, the vortex will have a speed of rotation, obtained from whatever caused it, and it will be fastest at the last area of the vortex, which had been being driven, when in contact with the causing flow. So, clearly, the ideal place to resume contact with a restored flow will certainly be this area.

In the case of an orbiting electron in an atom, the optimal re-connection will be with that key area of the vortex. And, for this to happen the two systems would have to both come together exactly as before.

Now, we must remember that the electron will be orbiting at a given speed, while the vortex, being of a different size, will be rotating at another. So we are looking for the best match between these two when they meet again. Otherwise, the most likely outcome will be that energy will just continue to be lost and the orbit of the electron will NOT be stable.

Now, we have the alternatives of first, almost all cases without an optimum match, and second, a series of cases with some sort of harmonic relationship, which will tend to minimise energy losses from the systems.

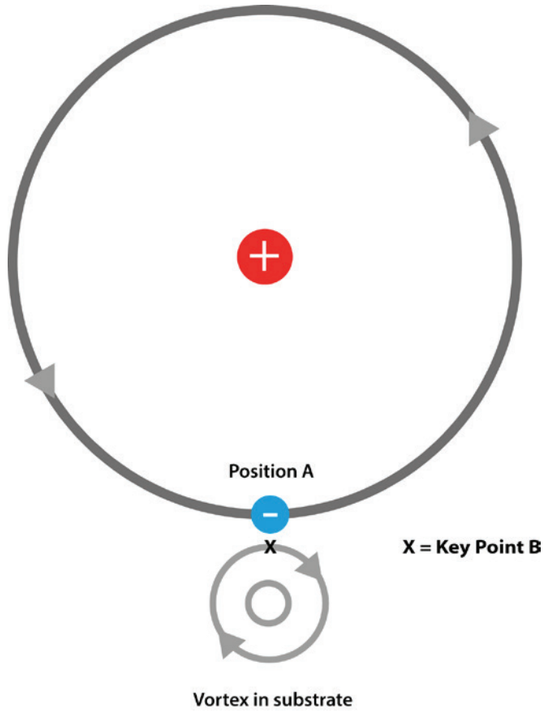
Now, there is still a conundrum about intermittent resonance, which has always intrigued me! When a resonance takes place, but for some reason the causing vibration is removed, the resonant oscillation will continue, and could itself cause a resonance in another suitable possible vibrator. But what if this was the now-still original cause, would it resonate due to the still vibrating original result?

What I am asking is, "Could not a recursion occur between suitably constructed potential vibrators?"

It was always, for me, a hypothetical question, based upon a holist stance. But, within the atom with access to a universal substrate, which contains available energy obtained from elsewhere, the system might well happen as described.

Model for 'Construction in Space 'Crystal" by Naum Gabo (1937)

Explaining the Stability of the Electron Orbit in the Atom



Carrying on with our attempt to explain quantized orbits of electrons within atoms, we have to consider the event when the electron returns to the same position as when it last parted from the vortex that it had created.

Now, if the best possible contact is to be resumed, it must be to the very same place on that rotating vortex, to get as near as possible to re-establishing the same sort of relation, BUT with a recursive addition - some of the energy in the vortex could be paid back!

The supposition is that any other re-connection will not be as fruitful, and could just tap more energy from the electron into a growing vortex, and a declining electron orbit.

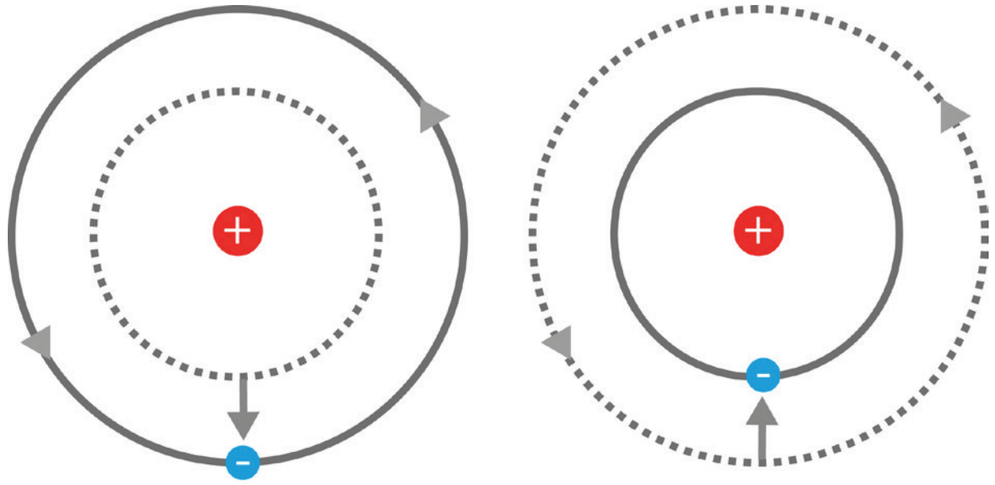
Now, what would have to happen for this required re-connection to occur?

The required matches would only occur if the relation between the orbit of the electron and the rotation of the vortex were in a harmonic relation to one another. Only then would the hook up be in the most advantageous link-up.

Now remember, we have purposely been concentrating upon a single vortex and its relations with the electron, but the very same things will be recurring continuously for each and every other vortex surrounding the entire orbit. Our contention is that it will be ONLY for these special conditions that the orbit will be stable.

Yet, even considering these ideal circumstances, the situation of absolutely zero losses will NOT be achieved, at least initially. But, with an added replenishment from the substrate (brought in from elsewhere) achieved overall in the initial, and all subsequent cycles, that stability will be possible.

The Promotion and Demotion of Atomic Electron Orbits



PROMOTION

Now, having seemingly cracked the quantization of electron orbits, there are still consequences to be fully explained.

First, how does an influx of energy actually promote the electron orbit to a higher energy level?

Forgetting the Mathematics, let us imagine the insertion of energy directly into the electron. It will, of course, go faster, and, once again, there will have to be a matching of the speeds so that the vortices in the substrate again lock into a stable orbit, where the two rotations are such as to always connect to one another at the same, most conducive places.

DEMOTION

Now, none of any prompted orbits will be permanently stable, so, as soon as it can, the electron will slip down into a lower stable orbit, as we have already defined, and in doing so, will give out a quantum of energy to some available recipient other atom, OR, much more likely, the all pervading substrate – for propagation!

Energy Transfers

We have not yet established the general cases of energy transfers to and from atoms – particularly those that involved interior electron orbits. We always assume, on the one hand, that atoms only have a fixed sequence of possible internal orbits for their outermost electrons, into which energy could be inserted or released – though these quantized orbits would still be confined to values below a fixed upper limit.

Also, in the universal substrate surrounding all such atoms, their components – the neutritrons, would also have internal orbits, but this time NOT quantized, so all values of energy could be accommodated, though, again, only up to a given upper limit, exceeding which may explain pair production.

But, with an isolation of either of these, and with, therefore, no targets available for receiving energy from promoted orbits, no transfers would be possible. Held energy would remain where it was!

Now, with a universal substrate literally everywhere this limitation would not occur, but related circumstances could well have the very same effect. Even with other potential recipients being at hand, transfers would still only occur in the right circumstances. With such available partners, certain rules would determine possible transfers.

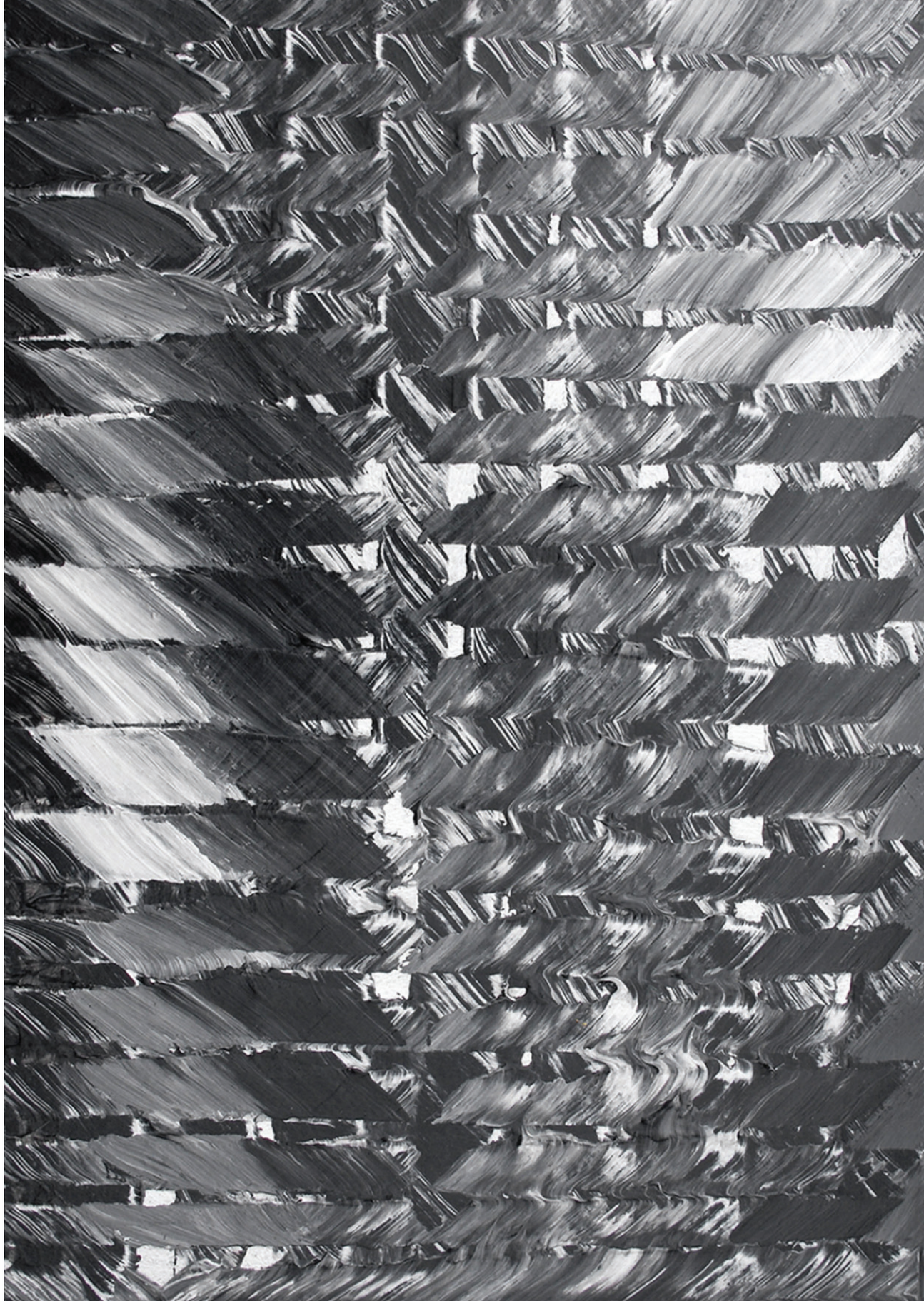
First, the recipient must be at a low enough internal energy level to receive energy from a more energetic donor – energy can't move uphill!

For example, if all the surrounding substrate elements are already carrying energy at a higher level, than our surrounded atom, then no transfer could occur from that atom to the substrate.

But, on the contrary, a transfer would be possible from the substrate element to the atom. High-energy atoms surrounded by low energy or "empty" substrate units, will, of course, unload immediately. There are obvious implications from these very simple constraints.

Consider an atom with a promoted electron orbit in a substrate of empty substrate units. Not only will that atom unload to the nearest "empty" substrate element, but that element in turn will off-load to another, so that a "bucket-brigade" type propagation occurs, carrying that released quantum of energy away. But, if the surrounding area of substrate elements all contained more energy than the atom, then two things will happen – first inter-unit transfers within the substrate will lead to an equalizing of the loads in all the local elements, no transfer would occur, and any included atoms with lower internal energy will also be prevented from unloading.

Also, if the opposite were the case, and the substrate over an extended surrounding area is generally elevated above the contained atom, then these atoms will ALL be promoted and KEPT at that level as no substrate units will be available for transfer out.



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Here is a brief list of some interesting books and papers that got me thinking when working on my Substrate theory. By no means do I agree with all of the ideas therein, but each has something unique to contribute to this debate.

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