

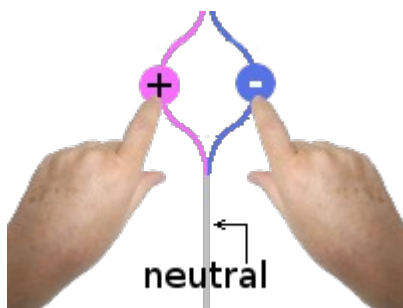
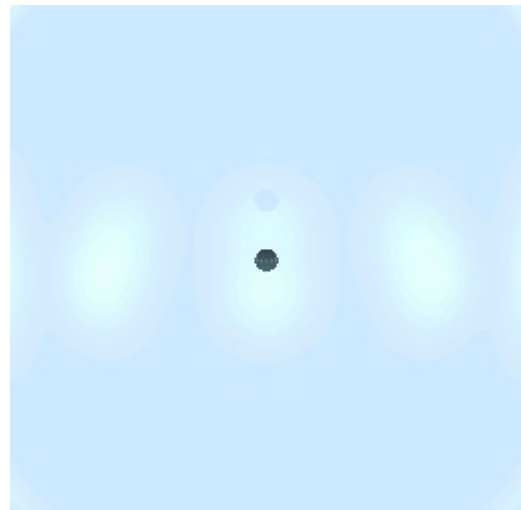
The Universe: Events and Waves

To any observer, the universe is a gigantic on-going event, comprising an eternal stream of consciously demarcatable features, borne as indelible etchings within the fabric of time, converging from every direction, into the sink-holes at the centres of the atoms of his eyes.

The consciously demarcatable features, of the great event we call the universe, are what we see as the separate events taking place within it. Each such event etches its mark upon the [fabric of time](#), which I postulate to be a universal essence called [the æther](#). The æther flows, like an infinity of unseen 3-dimensional conveyor belts, bringing sense of the event convergently towards each observer.

Science perceives what events etch upon the æther as waves. This is probably because, in many ways, they seem to behave like waves in water and air, which can be directly seen and felt. Waves in water can be seen in transit. Experiments [such as Kundt's Tube] can reveal sound waves in transit through air. Such waves can be indisputably observed as being divergent. They diverge, in every direction, away from the events that generate them. Notwithstanding, I think that what I shall refer to as a *wave in the æther* is fundamentally different in that, instead of diverging away from its source, it converges towards its observer.

Æther is continually converging towards, and disappearing into, every observer at velocity, c , as depicted by the animation on the right. As an event occurs, it etches its mark upon the passing æther, the way the swinging pen of a chart recorder writes its trace upon the moving chart paper. The apparent size of the event is determined by the solid angle it subtends from the observer's point of view. The intensity of the event is determined by the depth to which the event inscribes itself upon the æther. Or, in other words, by the depth of modulation with which the event polarizes the æther into its negative and positive components.



I imagine the process, by which the atom writes the event upon the passing æther, as being like as if the Fingers of God were to force apart its intertwined positive and negative strands. This would create a transverse electrical tension, like a stretched spring, within the observer's in-flowing æther. The reading process is when this tension is subsequently released as it arrives at the atom in the observer's eye into which the æther is flowing.

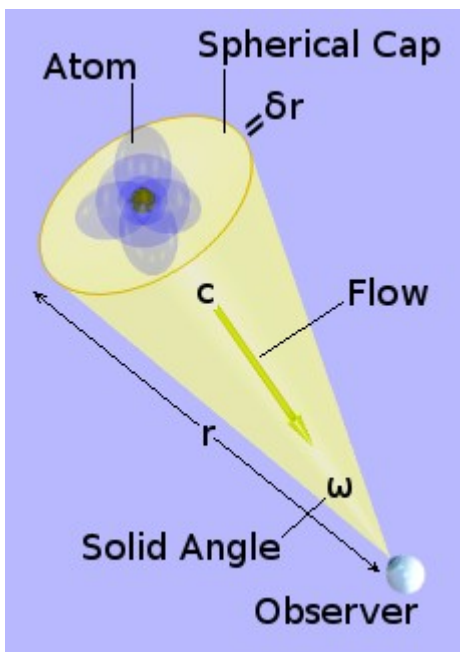
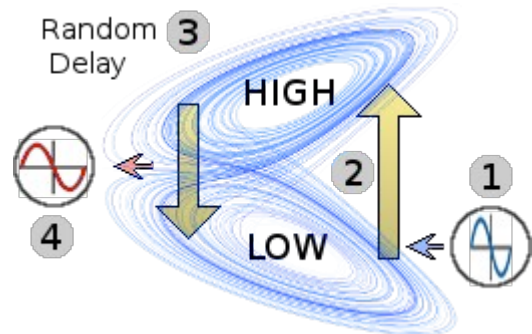
Any event, other than the universe itself, has a finite lifespan. It has a beginning, a middle and an end. During its finite life, it is continually writing its trace upon the fabric of time, namely, the passing æther. Once its life is finished, it ceases to exist - at least, as an active agent. Yet its whole

history is etched upon the ætherial inflow of each observer, to be unfolded before his eyes at some future time.

There exist many mechanisms and processes in nature which etch event traces onto the passing æther in the form of a polarization stress. One such mechanism is an atom. The term *passing æther* refers to æther flowing radially-asymmetrically relative to the atom. Whatever the atom may etch upon æther flowing radially-symmetrically into itself can never be seen by the outside universe.

A Natural Mechanism

In this context, an atom may be thought of as a complex-dynamical event-driven machine, as depicted on the right, which can exist, at any given time, in any one of a finite number of discrete states. As such, it normally rests in its LOWest (or ground) state, which is ostensibly stable. On occasions it is pushed, by an external event [1], into a HIGHer (or excited) state [2]. This higher state is only meta-stable. Consequently, after a seemingly random delay [3], the atom spontaneously falls back from its excited meta-stable state to its original stable ground state. In so doing, it inscribes a discrete modulation [4] upon the passing æther, which mainstream science refers to as a photon. Indeed, the original event [1], which triggered the whole sequence, could itself be a photon arriving on the atom's own radially-symmetrical ætherial in-flow.



An observer's in-flowing æther passes an atom as shown in the adjacent diagram. The area of the equal-density contour of this passing æther, upon which the atom can write, has the form of a spherical cap subtended by the solid angle ω . The atom spontaneously falls from its excited state to its ground state. In so doing, it etches a trace, upon the passing æther, as an electromagnetic stress of varying amplitude. If the duration of the whole event be δt then the entire inscription of it is etched within a solid-angle-shell of volume $V = (A = \omega r^2) \times (\delta r = c\delta t)$, where r is the distance between the atom and the observer. Once written upon, this solid-angle-shell of æther continues its journey towards the observer at velocity c , maintaining its thickness, $c\delta t$, while its cross-sectional area, A , continually diminishes as it proceeds towards the observer.

As the spherical cap of æther, upon which the event has been written, progresses towards the observer, its area diminishes as follows.

	Thickness of spherical cap:	$\delta r = c\delta t$ [deemed to be constant]
	So, velocity of spherical cap:	$dr/dt = c$ [which is \therefore a constant]
	Area of spherical cap:	$A = \omega r^2$
[i].....	Volume of spherical cap:	$V = (\omega\delta r)r^2$
	Its rate of change of volume:	$dV/dt = dV/dr \times dr/dt$
[ii].....		$V' = (2\omega c\delta r)r$

Thus, the *rate of change of volume* of the spherical cap diminishes linearly as the spherical cap proceeds towards the observer.

As the spherical cap of æther, upon which the event has been written, progresses towards the observer, the flux-density of the æther within it increases as follows.

	Density of the æther:	$\rho = k/V$ $= k/\{(\omega\delta r)r^2\}$
	Declare a new constant:	$Q = k/(\omega\delta r)$
[iii].....		$\rho = Q/r^2$
	Rate of change of density:	$d\rho/dt = Q \times (-2/r^3)$
[iv].....		$\rho' = -2Q/r^3$

Thus, while the flux-density of the æther within the spherical cap itself increases inversely as the square of its distance from the observer, its *rate of change* diminishes as the inverse cube of the distance.

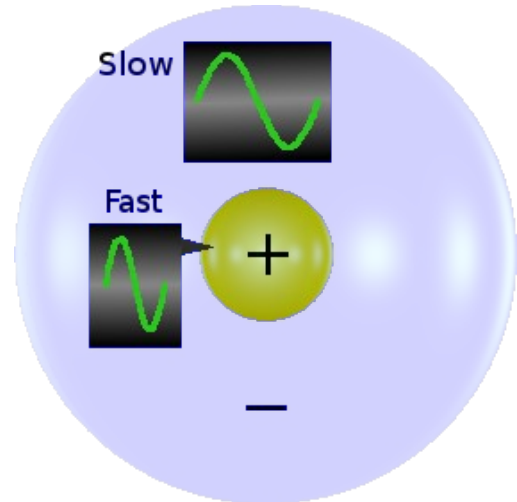
Further derivatives of the rate of change of ætherial flux-density with radius are:

[v].....	$\frac{6Q}{r^4}$,	$\frac{-24Q}{r^5}$,	$\frac{120Q}{r^6}$,	$\frac{-720Q}{r^7}$,	$\frac{5040Q}{r^8}$,	and so on...
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It is thus very clear that the rate of change of ætherial flux-density with distance is extremely non-linear. How relevant this is, to the mechanism whereby nature writes and reads the electromagnetic etchings on the æther, I don't know. I imagine the reading mechanism to be somewhat analogous to a magnetic read-head, which reads the signal from a magnetic tape passing by it. The only thing I can see as being relevant, therefore, is that, at the distance from the sink-hole at which the reading process takes place, the flux-density of the æther should be within the limits necessary to facilitate the reading process.

The æther, as I have conceived it in previous essays, flows into a sink-hole in the centre of each atom in the observer's retina. Notwithstanding, I think that the electromagnetic etchings on the æther must be read by the atom itself. I suspect that the reading process destroys or erases the etchings on the æther before it passes into the sink-hole.

Whether the etchings, arriving on the ætherial in-flow, are read by the standing-wave structure of negative æther (electron cloud) surrounding the nucleus or by the concentric standing-wave structure of positive æther (the nucleus itself) depends, I think, on the frequency - or more specifically, the rate of change of modulation depth (the rise rate or ramp gradient) - of the etched wave. I imagine that low-gradient waves are read within the peripheral region of sparse negative æther while high-gradient waves are read within the central region of higher-density positive æther, as illustrated by the adjacent diagram.



The reading process knocks the atom into a temporary meta-state from which it subsequently falls. The subsequent fall, at least for the slower rise rate waves of the visible spectrum, somehow triggers a signal in the observer's optical nerve, which conveys the signal to his brain, thereby giving him conscious sense of the event.

It would thus seem that the rules, by which the writing and reading processes take place, are as follows.

The Writing Process

The signature of an event can only be written onto an ætherial flux that is flowing radially asymmetrically through or across the writer.

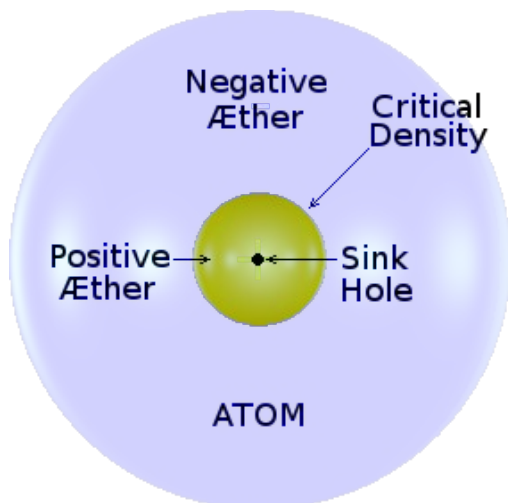
The signature of an event cannot be written to the ætherial flux that is flowing radially symmetrically into the writer.

The Reading Process

The signature of an event can only be read from the ætherial flux that is flowing radially symmetrically into the reader.

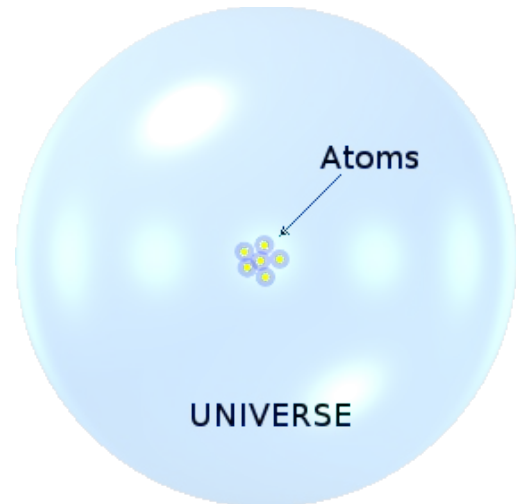
The signature of an event cannot be read from the ætherial flux that is flowing radially asymmetrically across or through the reader.

The writing and reading processes are themselves only the two end-points of the wave's journey as an inscription borne upon the observer's in-flowing æther. But what motivates the writing process? What powers it? It is the æther.



My hypothesis is that the æther, of which the universe is made, as represented by the large translucent sphere below, continually drains radially-symmetrically into sink-holes. Just as it is about to enter a sink-hole, the æther reaches a critical density at which its positive and negative components, due to a slight spherical asymmetry between them, naturally separate into a standing wave structure of positive æther, which faces radially inwards towards the sink-hole and a corresponding standing wave structure of negative æther, which is forced radially outwards to form a surrounding spherical shell. See illustration on the left.

Borne upon each others ætherial in-flows, the sink-holes accelerate towards each other. This causes them to congregate into clusters, as illustrated on the right. The concentrically polarized standing-wave structure, surrounding each sink-hole, repels others when in close proximity. This prohibits the sink-holes from merging. However, once the number and density of congregated sink-holes passes a certain threshold, the mutual repulsion of their surrounding standing-wave backwashes of polarized æther becomes insufficient and the sink-holes fuse together, thereby gaining larger more complex ætherial backwash structures.



Beyond this certain threshold of congregation density, the forced fusion of separate standing-wave structures into composite ones involves the separate accelerated compression of positive and negative æther. This means that separate regions of positive and negative æther suffer absolute accelerations. Depending on the forms and shapes of the standing-wave components involved, these accelerations can sometimes be radially symmetrical and other times not.

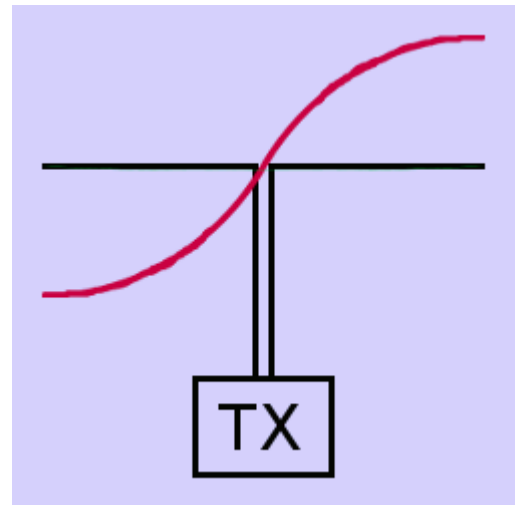
I propose that the crux of the writing mechanism be as follows. When a region of separate negative or positive æther is forcibly accelerated, it etches a mark upon (or electromagnetic stress within) the passing ætherial in-flow of a remote observer. Consequently, the forced accelerations of the separate regions of positive and negative æther, which occur in the fusion process, result in, what is conventionally perceived as, electromagnetic radiation.



Of course, what I have just described, in terms of my own hypothesis, is what mainstream science would call gravity-powered atomic fusion. And this is what causes the stars to shine. Fusion is not the only mechanism in nature which forcibly accelerates regions of separated negative or positive æther thereby writing upon the æther inscriptions we think of as electromagnetic radiation. Thermal agitation the macroscopic movement of regions of negative æther, such as lightning strikes, also write upon the æther. There are also artificial mechanisms.

An Artificial Mechanism

One such artificial mechanism is a radio dipole. The animation on the right shows a dipole powered by a transmitter [TX]. The red curve shows how the electromotive **force** (or voltage) varies throughout the length of the dipole. The space above the horizontal black line of the dipole represents positive voltage while the space below it represents negative voltage. The voltage motivates an electric current to flow along the dipole. The green curve shows how the amplitude of the current varies along the dipole. Note that the amplitude of the current follows 90° behind the amplitude of the voltage throughout the repeating cycle.

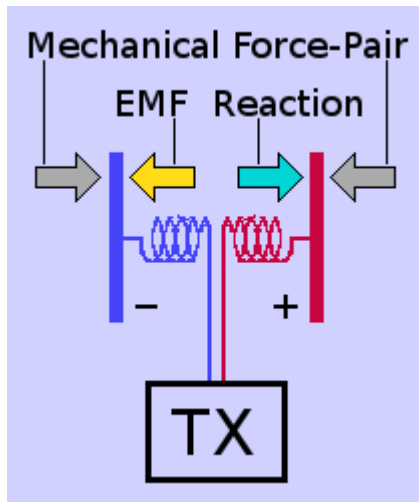


The transmitter produces the varying electromotive force (voltage), which drives the varying current, which induces a varying magnetic field around the dipole. In the conventional view, the current comprises a large herd of electrons moving along or through the conducting material of the dipole. These are being accelerated by the voltage, which is an electromotive **force**. Note that the electrons are not being pushed by a mechanical force against a *reactionary* electromotive force. On the contrary, the electromotive force is the prime mover, which is countered by the reactive inertia of each electron.

This is a cause and effect reversal of the situation with gravity. You can construct a mechanism to exert a mechanical force on a body to which the body's inertia will react. But you cannot construct a mechanism to generate a gravitational force field against which a body's inertia will react; especially not one that alternates sinusoidally. I must conclude, therefore, that a field of electromotive force cannot be regarded as being analogous to a bipolar version of gravity. It is a phenomenon which is, conceptually, quite different. Unlike gravity, an electromotive force-field exerts a real *mechanical* force upon negative æther.

I prefer to imagine the material of the electrical conductor, of which the dipole is made, as comprising a single standing-wave cloud of negative æther with zillions of small nuclei of positive standing wave structures nestling in regularly spaced niches of equilibrium. The alternating electromotive force field, produced by the transmitter, forcibly swills the outermost superficial layer of the negative æther cloud back and forth from one end of the dipole to the other. I shall presume that this is balanced by a counter swill of neutral æther.

The part of the red curve appearing above the dipole in the animation can be thought of as representing the amount of excess negative æther swilled towards its respective end of the dipole. The part of the red curve appearing below the dipole consequently represents the corresponding amount of neutral æther filling the space left by the shifted negative æther.



The diagram on the left represents a dipole in terms of functional symbols. The electromotive force [EMF] moves the superficial negative æther (conventionally known as electrons). It is a normal mechanical force. It therefore has a *reaction*, which acts against (gets its purchase from) the stationary material of the dipole, comprising the standing-wave structures of positive æther (atomic nuclei) surrounded by their respective standing-wave structures of negative æther (full electron shells). The absence of the superficial negative æther at one end of the dipole leaves there an excess of positive æther within the nuclei. This results in a mechanical force-pair acting along the dipole as if to compress or shorten it.

In the above diagram, the EMF is shown as a force that acts upon negative æther. It pushes electrons. This is the reverse of established convention but it follows the sequence of cause and effect within the mechanics of my hypothesis. It would be interesting to know what would happen if the two halves of the dipole were not joined together rigidly but by a spring. The mechanical force-pair would then cause the two halves to be pushed towards each other and then spring back again for each cycle of the transmitter's driving frequency. Would the resulting mechanical dissipation of the transmitter's power diminish the power of the "electromagnetic radiation" from the dipole? I will come back to this idea later on.

All these forces are dominant only during the part of the electrical cycle at which the dipole is not etching anything upon the passing æther (or, in conventional terms, when it is not radiating). The ætherial etching effect, on the other hand, is dominant when the flow of superficial negative æther (electrical current) along the dipole reaches a maximum. And, as can be seen in the above animation, this occurs at the centre of the dipole. This current gives rise to a magnetic field, whose strength waxes and wanes in phase with the current. It seems to me, therefore, that it is the magnetic field that actually etches marks onto the passing æther.

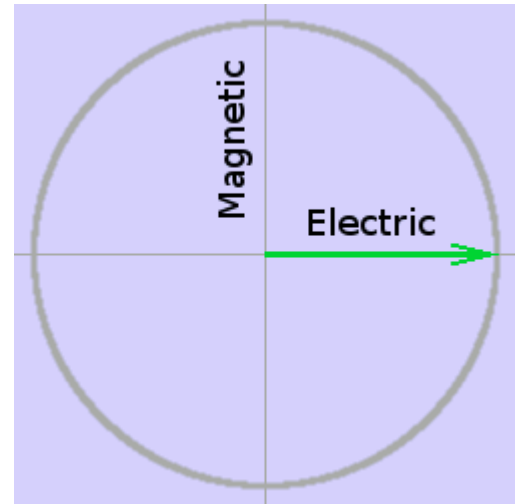
Previously, I described the etchings as a form of stress inscribed into the passing æther. In retrospect, however, I now prefer to think of the æther more in terms of a 3-dimensional conveyor belt upon which a layer of smooth sand is resting. The magnetic field of the dipole disturbs this passing smooth sand. The disturbance is preserved because there is no motive for the sand to re-smooth itself. It just stays as it was put, conveying the written mark onwards to the sink-hole into which it is being drawn.

Here, however, it is necessary once again to remember that, in free space, things are one differential with respect to time removed from our concepts formed within the terrestrial environment. The presence of a constant magnetic field merely maintains the neutral æther in a different state of smoothness than if the magnetic field were not present. So the observer, into whose sink-holes the æther is flowing, would perceive nothing. It is only a magnetic field that is *changing* in intensity that etches a feature onto the passing æther. Thus, it is only a *varying* magnetic field that can etch a detectable feature onto the passing æther.

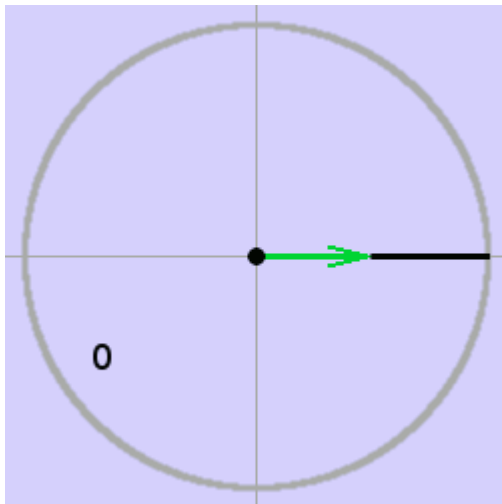
The transmitter is a radio-frequency alternating electrical power source. It drives the dipole. The alternating current along the dipole creates an alternating magnetic field within the space around it. This writes a regular alternating etching onto the passing æther of each observer. Each observer can thereby detect - be aware of - the presence of the source of the signal. A regularly alternating

etching of this kind does not, however, convey any meaningful information apart from the fact that the source exists and is active.

The adjacent animation represents, from the observer's point of view, the situation where a source dipole is etching a regular cyclic signal onto passing æther. The horizontal red arrow is what we perceive as the electric component of the etching while the vertical blue arrow is what we perceive as its magnetic component. The dipole lies along the horizontal axis of the animation. Notwithstanding, what we perceive as the electric and magnetic components are really the same thing seen from different points of view. The magnetic component is nothing more than a manifestation of the rate of change of the electric component and vice versa.



Human beings have no specific senses for electric and magnetic force-fields. We only have instruments with which to transduce them into visual indications on, for example, a meter or an oscilloscope. The indications we get may be thought of as two mutually perpendicular "edge-on" views of the same phenomenon. What we are really looking at - from two disadvantageous angles - is a singular electromagnetic phenomenon, represented in the animation by the rotating green arrow.



The cyclic etchings, arriving regularly upon the observer's in-flowing æther, do not carry any meaningful information. They are, nonetheless, capable of being wilfully modulated to convey symbolic intelligence. In the above animation, the green electromagnetic vector remains at a constant amplitude, which is represented by the radius of the grey circle. However, if the amplitude of this vector were to be flipped back and forth between its full amplitude and half that amount in a predetermined way, as shown in the adjacent animation, it could be made to carry a sequence of digital bits, which could be made to represent meaning to the observer.

The sample of digital modulation above is shown for only the first quadrant (90 degrees) of the full (360 degree) cycle. The whole of the cycle can, of course, be modulated to convey meaningful information.

When receiving signals, that are transmitted in this way, a dipole can sense only the electric vector. This is polarized horizontally in the animations. My intuition is that, as a result, the vertical component of the modulations would be far less well defined than the horizontal component. To get good definition of the modulated content, around the whole 360° cycle, I suggest that the dipole should work in conjunction with a means of capturing the (vertical) magnetic vector. The magnetic signal should be then transformed into a second electrical signal phased one quadrant (90°) behind the dipole's output to form a 4-pole resolver signal. This should provide well defined content around the full 360° of the cycle.

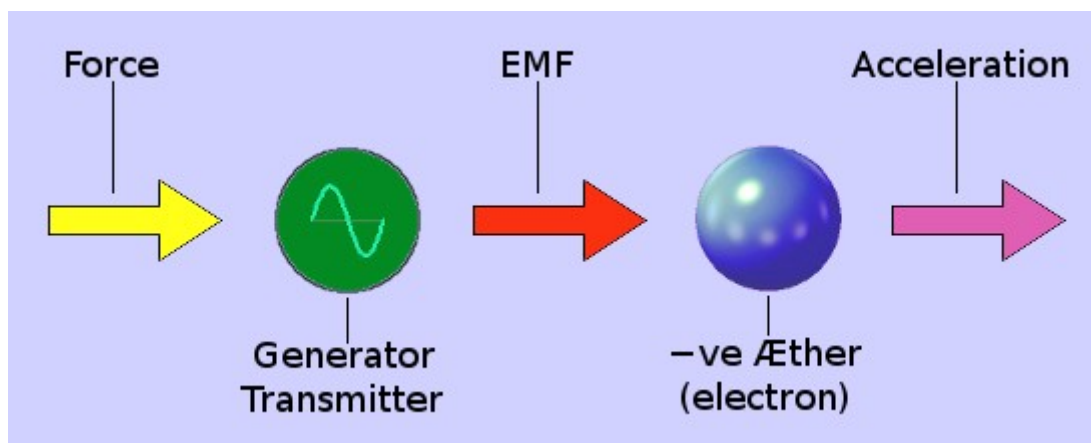
Information conveyed in this way, between an originator and a recipient, is symbolic. It does not, within and of itself, contain any understandable meaning. It needs a context, which both the originator and the recipient already possess, in order for the recipient to know what the originator is saying. This context is called *metadata*, which is a [vital key](#) to unlocking the meaning from the received symbols.

The above artificial mechanism, for sending intelligent signals, still uses the same underlying natural mechanism to etch the æther as does the atom. It accelerates negative æther. The standing-wave structure of negative æther, which forms the outer shell around a sink-hole, is large enough to host the short fast accelerations of the orders required to etch visible light. The dipole, on the other hand, is able to host the longer slower accelerations, required to produce radio-frequency etchings, by using the composite standing-wave structure of negative æther composed of the entire lattice of atoms that forms the conducting material of the dipole.

An excited atom contains its own source of EMF, which drives the momentary acceleration of part of the negative æther within its outer standing-wave structure, causing it to etch a mark onto all non-radial æther flows. On the other hand, a much larger amount of negative æther, within the composite standing-wave structure of the entire lattice of atoms that forms the conducting material of the dipole, is accelerated by the external EMF provided by the transmitter.

The Primality of Force

It is relatively easy to see that the prime mover of the whole process, whereby a radio dipole etches a signal onto the passing æther, is plain mechanical force. Mechanical force is used to turn an electrical generator. This produces electricity, which powers the transmitter. The transmitter generates a radio-frequency EMF along the dipole. This accelerates negative æther (drives an electric current) along the dipole. This, in turn induces a changing magnetic field, within the space around the dipole, which etches an alternating signal onto the passing æther. This cause-and-effect sequence is summarized in the following diagram.



The prime mover of the light produced by stars is also plain mechanical force. The radially-symmetrical flows of the æther into sink-holes causes them to accelerate towards each other. This causes them to congregate ever closer until they are on the point of merging.

The outer standing-wave structures of negative æther (electron shells) surrounding neighbouring sink-holes mutually resist each other's proximity by exerting real mutually repulsive forces. But ever-increasing proximity causes the ætherial flux density to continue to increase until the repulsive

force of each sink-hole's outer shell of negative æther (electrons) is no longer sufficient. The outer shells of neighbouring sink-holes merge.

The inner standing-wave structures of positive æther (nuclei) then exert stronger mutually repulsive forces. But the continued ever-increasing proximity causes the ætherial flux density to continue to increase until the repulsive force of each sink-hole's inner structure of positive æther (nucleus) is no longer sufficient. The inner structures of neighbouring sink-holes (nuclei) then merge. They fuse together. In so doing, the work done by these two stages of repulsive force is liberated as light.

Thus, in both cases, it is ultimately mechanical force which - albeit indirectly - etches its marks upon the ætherial in-flow of every sink-hole in the universe. Hence, it is exclusively the wilful manipulation of pure *mechanical force* which enables us, as conscious beings, to communicate with each other.

Ætherial Compression Waves

Of course there are sound waves and ocean waves, and indeed, so-called chemical waves. But my interest here is in the possibility that there may exist another kind of wave which can travel through the æther. The so-called electromagnetic wave, which I have discussed above, is, according to my hypothesis, a transverse polarization etched onto or into the æther. It is a rift, between its negative and positive components, which is somehow frozen into the travelling æther.

I proposed that the æther be what I called a velocity fluid, which always travels, relative to all objects, at velocity c . It flows radially-symmetrically into sink-holes, increasing its density as it goes. Consequently, the æther that I have proposed is compressible. Could it therefore host and convey compression waves also?

At the time of writing, to the best of my understanding, inertial waves (ætherial compression waves) have [never been detected](#). Notwithstanding, it is my conjecture that some of the most fundamental elements of our every-day experiences of physical dynamics are overwhelming evidence of their effects, and hence, their existence. To investigate this, it is first necessary to look at the notions of force, mass and acceleration in a somewhat different light.

What is humanly perceived as acceleration (rate of change of velocity) embraces two distinct phenomena. These are:

1. **relative** acceleration, and
2. **absolute** acceleration.

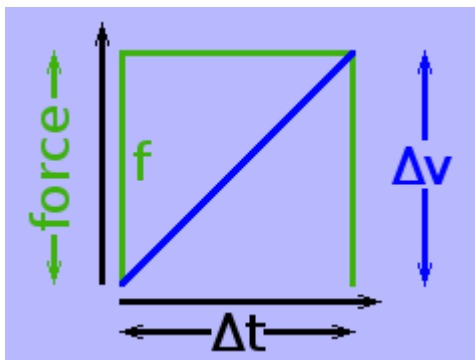
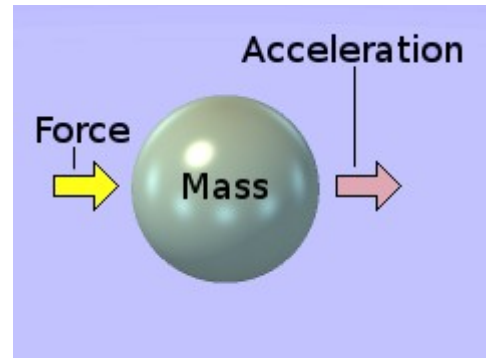
Absolute acceleration requires an applied force: relative acceleration does not.

The most straight-forward example of relative acceleration is when two objects pass each other on a non-collision course in simple 3-dimensional Euclidean space. Each object is moving at constant velocity along its own straight course. Each is therefore at rest with respect to the æther. It is suffering no external applied force. Yet from the point of view of one of the objects (the observer), the other object accelerates towards him during its approach, passes by, and then decelerates as it recedes from him. Furthermore, the acceleration and deceleration concerned are extremely non-linear. Consequently, the fact that an object appears to be accelerating does not necessarily mean that it is being acted upon by a directed external force. In other words $\mathbf{f} = m\mathbf{a}$ ain't necessarily so.

Absolute acceleration is caused when an object is momentarily perturbed, by a directed external force, from its state of rest with respect to the æther. An object, in this context, comprises one or more ætherial sink holes and the electromagnetically polarized æther which surrounds them. In

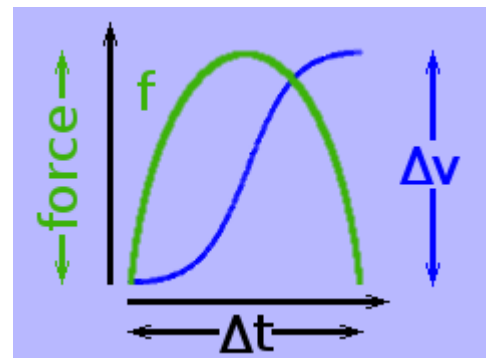
other words, an object is a solid composite (such as a ball bearing) which comprises one or more atoms or components of atoms.

Imagine a solid sphere in free space, as shown in green on the right. An external directed force is applied to the sphere, as indicated by the yellow arrow. This causes the sphere to accelerate as indicated by the pink arrow. The degree to which the sphere accelerates is directly proportional to the amount of force applied to it. The constant of proportionality, which relates the rate at which the sphere accelerates in response to a given amount of applied force, is called the sphere's mass.



Suppose the force is kept at a constant value and is applied for an amount of time Δt . The force, f , is shown graphically by the green square-wave on the left. It rises instantly to its full value, remains at that value for the prescribed amount of time, Δt , then drops back to zero instantly. The velocity, v , of the sphere increases at a constant rate, as shown by the blue line. During the small period Δt , throughout which the force is applied, the sphere's velocity increases by Δv .

In reality, nature does not readily facilitate the instantaneous rise of a force from zero to a tangible value, the way I have shown it above. In the real world, the rise and fall of the force would generally be somewhat sinusoidal, with the velocity of the object following more of a sigmoidal curve. After the sphere has undergone its short burst of acceleration, its relative velocities, with respect to all other objects in the universe, have changed by an amount Δv .



Of course, the sphere's change in velocity, relative to any other specific object in the universe, is the resolved component of Δv (namely, $\Delta v \times \cos\theta$) in the direction of that object, where θ is the angle between the path along which the sphere was accelerated and the bearing of the object from this path.

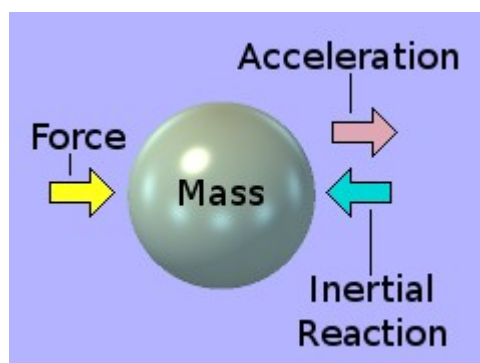
The actual value, v , of the sphere's relative velocity - whether before or after the acceleration - has little significance. For instance, if we were in a frame of reference in which the sphere's initial velocity were enormous in the left-ward direction, then the force shown would be a decelerating force, which would be perceived as merely slowing the sphere down a little.

The sphere's relationships with all other objects in the universe have therefore changed. Its relationship with the rest of the universe has changed. Thus, a change has occurred. A force has been applied through a distance. Energy has been expended. A dissipative event has taken place.

Notwithstanding, the sphere was at rest with respect to the æther before it was accelerated and it is again at rest with respect to the æther after it has been accelerated. Consequently, from the point of view of the sphere itself, its status quo is the same as it was before the event. So where is the effect of the event now? Where has the energy gone? Clearly, it is no longer with, at or inside the sphere.

Inertial Reaction to The Force

When a force is applied to an object, the object does not suddenly acquire an infinite velocity relative to every other object in the universe. It seems to accelerate at only a finite rate, which is proportional to the applied force. Something seems to impede the force's attempt to change the object's velocity. This creates an illusion that the object is itself reluctant to have its velocity changed. This reluctance is perceived as an *inherent property* of the object itself, which we call *inertia*.



When an accelerating force is applied to a sphere, the sphere applies an equal and opposite reaction against the applied force. This is known as an inertial reaction. Why does this inertial reaction exist? From where does it come? Why doesn't the applied force simply induce the sphere to accelerate at an infinite rate? Conventional science answers that it is because the substance of the sphere has mass and that the inertial reaction is a result of mass's inherent reluctance to be perturbed.

This notion obviously comes from our everyday experiences of objects here on the surface of the Earth. From a universal perspective, however, this argument is rather nebulous. Mass is simply the constant of proportionality that relates an observed amount of force with an observed amount of acceleration for a particular object such as the green sphere. It sheds no light on the observation that the sphere seems to be somehow connected to the rest of the universe, albeit in a sense which is one *differential with respect to time* removed from solid anchorage.

To me, a more cogent idea is that the sphere is immersed in - or is part of - some kind of hyper-fluid whose viscosity impedes the sphere's acceleration. I call it a hyper-fluid because, unlike a conventional fluid, it does not impede, in any way, the passage through it of an object travelling at constant velocity. In fact, for an object travelling at constant velocity, it isn't even there. It doesn't exist. It only manifests its existence when an applied force attempts to *accelerate* an object through it. The amount of impedance it offers is directly proportional to the object's acceleration through it. This hyper-fluid is what I have called the æther.

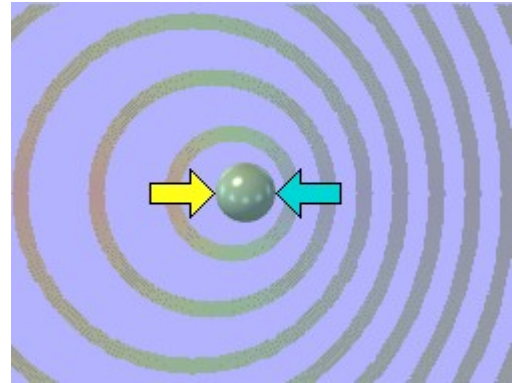
There is a very important difference, which must be noted, between a normal physical fluid and the æther.

If the green sphere were moving through water, the resistance the water exerted would vary non-linearly with the sphere's velocity through it. This is because water can flow easily around the sphere at low velocities. However, as the velocity increases, the water cannot pass round the sphere fast enough. This results in a pressure zone in front of the sphere, which increases in volume as the sphere's velocity increases.

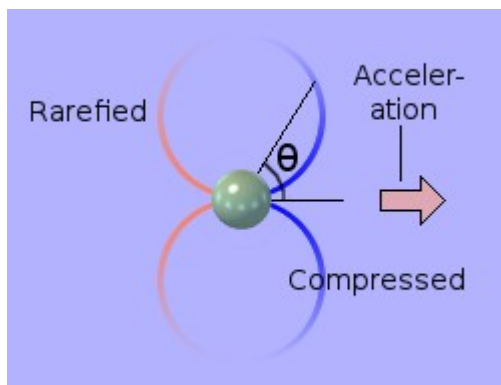
If the green sphere is accelerating through the æther, this acceleration is strictly proportional to the force applied. This suggests that the æther does not or cannot "flow" around the sphere. The æther does not therefore act upon the surface of the sphere as water does. Instead, it appears to apply its

inertial reaction at every point within the substance of the sphere. Furthermore, there is no detectable lag between the application of the force and the equal and opposite inertial reaction. Every point within the substance of the sphere would thus appear to have a direct and immediate connection to the æther.

In the illustration on the right, the sphere is accelerating towards the right as the result of a constant force (yellow arrow) applied to its left side. The acceleration of the sphere is impeded by the æther, which, as a result, exerts an equal and opposite reaction (blue arrow) against the force. The æther exerts this reaction as a result of becoming compressed to the right of the sphere and rarefied to its left, as depicted by the circular contours. Perpendicular to the force, the æther is unperturbed.



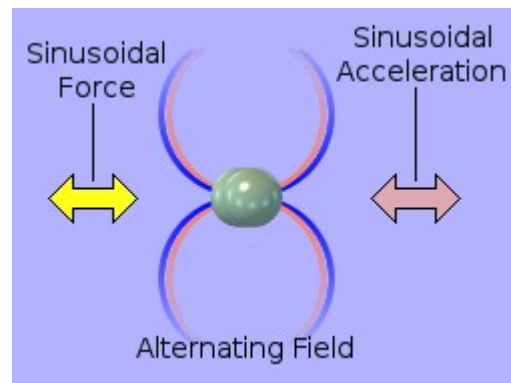
The circular contours shown above are only observational snap-shot samples of the actual ætherial compression and rarefaction. The true profile of the compression-rarefaction wave is, in reality, the shape of an expanding pear.



At any instant, while the sphere is accelerating, there exists an ætherial compression gradient field around it. This may be visualised as an infinite number of concentric horn-tori whose surfaces are contours of constant compression gradient. The illustration on the left shows the vertical cross-section through one such contour. It shows the field to be that of a dipole, like the familiar "lines of force" around a magnet. The accelerating sphere can thus be thought of as an ætherial compression-gradient dipole.

The amount of ætherial compression, throughout the spherical shell of an ætherial compression wave, is not homogeneous. The æther is compressed on the advancing side of the object and rarefied on the receding side. The degree of compression and rarefaction are maxima along the axis of the force, both diminishing co-sinusoidally to zero in the plane perpendicular to the axis of the force through the object. The two circular "lines of force" in the above illustration are lines of constant compression-gradient. Compression (blue) is strongest where the blue line emerges from the sphere in the direction of acceleration ($\theta = 0$). The compression weakens co-sinusoidally as the angle θ increases, until it becomes zero at $\theta = 90^\circ$. As θ increases beyond 90° , rarefaction (pink) sets in and increases co-sinusoidally with θ until it reaches a maximum when $\theta = 180^\circ$ where the pink line enters the sphere. Of course, the compression-gradient field disappears when acceleration ceases.

Suppose that the force, applied to the sphere, oscillates sinusoidally. It is opposed by an equal inertial reaction, which is in phase with the force. The sphere suffers a sinusoidal acceleration which is in phase with the inertial reaction. The acceleration creates an in-phase sinusoidal field around the sphere, as shown on the right. Suppose the sinusoidal force is now withdrawn. The field disappears and the sphere returns to the velocities it had, relative to all the other objects in the universe, before the force was applied.



Consequently, the kinetic energy of the sphere, relative to each object in the universe, is as it were before the force was first applied. Notwithstanding, during the time it was applied, the sinusoidal force expended a lot of energy. If the sphere's kinetic energy, relative to each object in the universe, be unchanged, where did all this energy go? What form did it take? The only place it can have gone is into the creation of the compression wave in the æther around the oscillating sphere.

In principle, this is similar to the way the air piston (or cone) of a loudspeaker produces compression waves in the air, which we perceive as sound. The difference is that, whereas the air, being a physical fluid, responds to the *velocity* of the piston, the æther responds only to the *acceleration* of the sphere.

Asymmetrical Æther Flow

This notion of the compression and rarefaction of the æther is not the whole story, however, because the æther is not stationary: it is - by its very nature - always in a state of flow. It is flowing continually into the sink-holes within the matter of which the sphere is made.

Consider one sink-hole, within the material of the sphere, in the situation where the sphere is not accelerating. The æther is flowing into the sink-hole in a spherically-symmetrical fashion. In other words, the æther is flowing radially, from every direction, into the sink-hole.

Now consider the case where the sphere is being forcibly accelerated in a particular direction. The flow of the æther into the sink-hole is no longer spherically-symmetrical. Referring to the last but one illustration above, the radial flow on the left of the sink-hole will become starved of æther-flow, while radial flow on the right will become inundated. To my mind, this results in the impedance which the æther puts up against the forced acceleration. I speculate that this impedance is what creates our illusion of mass.

A corollary to this illusion is that the energy expended by a force applied to an object over a distance, becomes the increase in the object's kinetic energy resulting from its increase in velocity. Notwithstanding, force, like temperature, is an absolute measure. It must always be measured from the same absolute zero. Consequently, energy expended by a force acting over a distance must also be an absolute measure. Velocity, on the other hand, is a relative measure. It can only be stated with respect to an arbitrary observer or frame of reference. Consequently, kinetic energy also can only be stated with respect to an arbitrary observer or frame of reference. Absolute energy (force \times distance) and kinetic energy ($\frac{1}{2}\text{mass} \times \text{velocity}^2$) are therefore measures of different stuff. The one cannot be converted into the other.

I use the term *impedance* rather than resistance. This is by analogy with a reactive electrical circuit. I believe that *inertial force* impedes rather than resists the acceleration of an object. In other words, the inertial force itself does not dissipate energy.

For this reason, I perceive the æther to be the one and only perfect fluid. As such, it is a continuum whose "substance" cannot be broken, severed or sharded. In other words, it is fundamentally impossible for any object within it to be accelerated to the point of breaking the ætherial "sound barrier". Since the æther only manifests its existence to an *accelerating* body, the ætherial "sound barrier" is necessarily a *rate of acceleration*, not a velocity. A pertinent question must be: is there an absolute maximum possible rate of acceleration? To put it another way: could the relationship between applied force and resulting rate of acceleration be non-linear? I wish to leave these questions open - at least for the time being.

Power - energy per unit time - is needed to apply a force to an object, thereby causing it to accelerate. This power must be supplied by an external agency of some kind, such as a rocket motor. If, as I have speculated above, the inertial reaction to this applied force is an impedance rather than a resistance, then it does not dissipate the power being supplied by the rocket motor. So where does this power get dissipated? Where does the energy go?

Energy Expended by The Force

To answer this question, it is necessary to begin with 2 definitions, which are really artificial conventions adopted by scientists. The first definition is that acceleration is the rate of change of velocity with time, i.e.: $\text{acceleration} = \Delta(\text{velocity}) \div \Delta(\text{time})$.

The Δ prefix signifies a *change* as opposed to a measurement made with reference to an absolute datum. Thus $\Delta(\text{velocity})$ signifies a *change* in the relative velocity of an object without reference to any designated "stationary" object such as the Earth. Likewise, $\Delta(\text{time})$ signifies a period of time (so many seconds) stated without reference to any time standard such as Greenwich Mean Time (GMT).

For the convenience of the following discourse, however, I would like to rearrange it as a definition of the time interval, $\Delta(\text{time})$, over which a burst of *constant* acceleration takes place. The second is the definition of energy, or rather, a *change* in energy. The two definitions can therefore be written as:

1. $\Delta(\text{time}) = \Delta(\text{velocity}) \div \text{acceleration}$
2. $\Delta\text{energy} = \text{force} \times \Delta\text{distance}$

To these I wish to add 3 fundamental scientific *observations*. Be well aware that these are direct observations of nature. They are not derived from anything else. This is important.

3. $\Delta(\text{average-velocity}) = \Delta(\text{velocity}) \div 2$
4. $\Delta(\text{distance}) = \Delta(\text{average-velocity}) \times \Delta(\text{time})$
5. $\text{force} = \text{mass} \times \text{acceleration}$

The variables prefixed by the Δ symbol are, by nature, relative quantities. They have no absolute zero. The variables without a Δ prefix are, by nature, absolute quantities. They have a zero value which is universally absolute. This distinction is very important. In this present context, each absolute variable will be considered to be held at a constant value.

By substituting expressions 3. and 1. respectively in expression 4., it is possible to derive, algebraically, a useful consequence, as follows.

$$\begin{aligned} \Delta(\text{distance}) &= \{\Delta(\text{velocity}) \div 2\} \times \Delta(\text{velocity}) \div \text{acceleration} \\ 6. &= \frac{1}{2}\{\Delta(\text{velocity})\}^2 \div \text{acceleration} \end{aligned}$$

By substituting expressions 5. and 6. respectively in expression 2., it is possible to derive an expression for the energy expended by a force when it is applied to an object for a duration $\Delta(\text{time})$ through a space $\Delta(\text{distance})$.

$$\begin{aligned} \Delta(\text{energy}) &= \text{mass} \times \text{acceleration} \times \frac{1}{2}\{\Delta(\text{velocity})\}^2 \div \text{acceleration} \\ &= \text{mass} \times \frac{1}{2}\{\Delta(\text{velocity})\}^2 \\ 7. &= \frac{1}{2}\text{mass} \times \{\Delta(\text{velocity})\}^2 \text{ [familiar expression for kinetic energy]} \end{aligned}$$

In my conception, mass is not an inherent property of the object being accelerated. It is simply a constant of proportionality relating $\Delta(\text{energy})$ to $\Delta(\text{velocity})$.

A Problem of Reference

The above formula expresses the energy, $\Delta(\text{energy})$, expended by the force, in terms of the change in velocity, $\Delta(\text{velocity})$, of the sphere. To be able to calculate the energy, therefore, it would be necessary to be able to measure the sphere's change in velocity.

Within the context of the sphere, this would necessitate the presence of other objects somewhere within the field of view for use as points of reference against which to gauge the sphere's change in velocity. Alternatively, the page could be considered an observational frame of reference with the sphere itself moving within the field of view of the illustration.

Unfortunately, either of these options would complicate the situation enormously. A more fundamental approach is required.

A Minimalist Approach

To construct this more fundamental view, it is necessary to make a simple statement, which is true, although counter-intuitive within the context of human experience in a terrestrial environment:

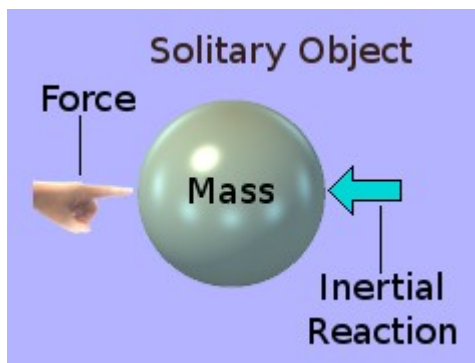
Velocity is not a property of an object. It is a property of the *relationship* between two objects.

This is why the adjective *relative* so often prefixes the word *velocity*. The same is true of distance, which is merely the special case where the relative velocity between two objects is zero.

For instance, to say that the Earth has a certain velocity of so many thousands of kilometres per hour is meaningless without some qualifying addendum. Over any short time interval Δt , the Earth has one velocity relative to Venus, a different velocity relative to Mars, another velocity relative to Jupiter, and so on for every other object in the universe. Consequently, from Venus' point of view, the Earth has a certain amount of kinetic energy. From Mars' point of view, the Earth has a different amount of kinetic energy. From Jupiter's point of view, the Earth has yet another amount of kinetic energy, and so on for every object in the universe.

As I said, the above considers the case over a very short time interval Δt . In the long term, as the Earth and Mars move round their orbits. The relative velocity of their approach or recession is substantially non-linear. Hence, in the long term, the Earth's kinetic energy, from the point of view of Mars, varies non-linearly. And it follows, therefore, that so does its kinetic energies relative to all the other planets.

Such non-linear changes in relative kinetic energy cannot be accounted for through any notion of changes in what scientists term potential energy. This is evinced by the passive acceleration, which takes place when two bodies approach then recede from each other when passing on a non-collision course in free space. Here, in the absence of gravity or orbits, the relative velocity - and hence the relative kinetic energy - between the two bodies varies non-linearly without any interaction taking place between the two bodies. No potential energy is involved.

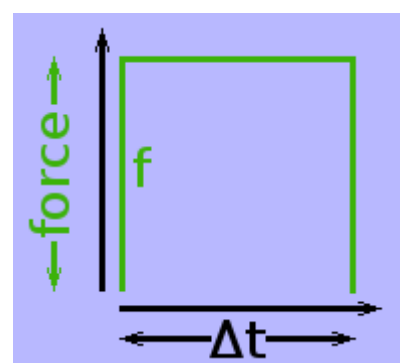


In order to get to the heart of the matter of an object's relationship with the universe, it is necessary to consider a solitary object in space, with no other object within sight or influence. In other words, the object cannot be examined from the point of view of any frame of reference other than its own. The object itself is its own observer. Let us suppose that a force is applied by the Finger of God, to which the object reacts with an equal and opposite force of inertia.

I use the Finger of God to signify a force which is supplied from outside the context of the physical - i.e. the measurable - universe. This force is applied to the object, namely, the green sphere. The object - as the observer - experiences the force at one point on its left side. From this point, the rigid structure of the object transmits the force to all its parts. The force is thus distributed from a point on the object's surface to all its parts. On the other hand, the inertial reaction to the force emanates from every part of the object. It is transmitted from each part of the object, through the object's rigid structure, to the single point on its left side at which God applied his Finger.

I have not included in the above illustration any indication that the object, as a result of the applied force, is in a state of acceleration. This is because, in order to acquire a notion of acceleration, it is necessary to refer to other objects. And in this present context, there are no other objects within sight or influence. The object is alone in the universe. The universe is infinite. The universe is made of æther. The object is immersed in an infinite sea of æther.

Within this present context, therefore, the object - who is also its own observer - can have no notion of velocity, space or even acceleration. So what is left? How can the observer be consciously aware of anything? The answer is *time*. And *time* is a very difficult notion to get a handle on. However, if the observer has any conscious sense at all, he can experience the event of the force being applied to the object in the first place and also the event of its cessation, i.e. when the force is withdrawn or removed from the object.



In this minimalist situation, the observer can experience the square-wave event illustrated above on the right. However, this necessitates that the observer have a sense of time. He must be able to experience - and hopefully measure - the passage of the period Δt and be aware that there was an epoch pre-dating the application of the *force* and an epoch post-dating its cessation. As with distance, velocity and acceleration, time can only be measured with respect to a recognizable object of reference. In other words, the observer needs some kind of reference clock, which emits regular

tick signals. In the terrestrial environment, day and night, moon phases and the annual seasons provide natural clocks. However, in this minimalist situation, the observer would need to use his heartbeat or some kind of artificial clock in order to gauge the duration of Δt .

In this minimalist context, of a solitary object in space with no other object within sight or influence, it is possible to construct a temporal frame of reference. It is even possible, thereby, to construct a means of measuring the rate of passage of time. To do this, we must divide the sphere into two separate concentric spheres. We set the small inner concentric sphere rotating. We keep the outer concentric spherical shell rotationally stationary. The rate of rotation of each can be gauged by the magnitude of the static centrifugal force within its material. For simplicity, let us assume that the Fingers of God exert a torque upon the inner sphere for a given period of time in order to set it spinning. Each time a mark on the outer surface of the rotating sphere passes a corresponding mark on the inner surface of the spherical shell defines one standard time period. Thus we can measure Δt .

This Energy In Terms of Time

Unfortunately, in this minimalist context, the observer has no sense of - or means of measuring - the increase in relative velocity, Δv , of the object. Consequently, the observer cannot determine the energy expended (work done) by the force exerted by the Finger of God. However, since he can measure the duration Δt of the force's action, he can determine the object's change in momentum, $\Delta(\text{momentum})$, viz:

$$9. \Delta(\text{momentum}) = \text{force} \times \Delta(\text{time})$$

But momentum can also be expressed as:

$$\begin{aligned} \Delta(\text{momentum}) &= \text{mass} \times \Delta(\text{velocity}) \\ 10. \Delta(\text{velocity}) &= \Delta(\text{momentum}) \div \text{mass} \end{aligned}$$

The energy, $\Delta(\text{energy})$, expended on the object by the force is

$$\begin{aligned} \Delta(\text{energy}) &= \frac{1}{2}(\text{mass}) \times \{\Delta(\text{velocity})\}^2 && \text{from equation (7.)} \\ &= \frac{1}{2}(\text{mass}) \times \{\Delta(\text{momentum}) \div \text{mass}\}^2 && \text{substitute equation (10.)} \\ &= \frac{1}{2}\{\Delta(\text{momentum})\}^2 \div \text{mass.} \\ &= \frac{1}{2}\{\text{force} \times \Delta(\text{time})\}^2 \div \text{mass} && \text{substitute equation (9.)} \\ 11. &= \frac{1}{2}\{\text{force}^2 \div \text{mass}\} \times \{\Delta(\text{time})\}^2 \end{aligned}$$

I like to conceptualize mass as a *coefficient of inertia per sink-hole*, k , times the *number of sink-holes*, n , within the object. Thus $m = k \times n$. The amount of force applied to the whole object is n times the force, $\delta(\text{force})$, applied to each of the n sink-holes within the object. So $\delta(\text{force}) = \text{force} \div n$. Equation (11.) above thus becomes:

$$\begin{aligned} \Delta(\text{energy}) &= \frac{1}{2}\{[\delta(\text{force}) \times n]^2 \div (k \times n)\} \times \{\Delta(\text{time})\}^2 \\ &= \frac{1}{2}\{\delta(\text{force})\}^2 \times n^2 \div k \div n \times \{\Delta(\text{time})\}^2 \\ &= \frac{1}{2}\{n^2 \div k \div n\} \times \{\delta(\text{force})\}^2 \times \{\Delta(\text{time})\}^2 \\ &= \frac{1}{2}\{n \div k\} \times \{\delta(\text{force}) \times \Delta(\text{time})\}^2 \\ 12. &= \{n/2k\} \times \{\delta(\text{momentum})\}^2 \end{aligned}$$

The energy, $\delta(\text{energy})$, expended by the divided force, $\delta(\text{force})$, upon each ætherial sink-hole for the same duration of time, $\Delta(\text{time})$, is one n^{th} part of the energy expended by the full force upon the whole object:

$$\begin{aligned}
 \delta(\text{energy}) &= \{1/2k\} \times \{\delta(\text{force})\}^2 \times \{\Delta(\text{time})\}^2 \\
 &= \{1/2k\} \times \{\delta(\text{force}) \times \Delta(\text{time})\}^2 \\
 &= \{1/2k\} \times \{\delta(\text{momentum})\}^2 \\
 13. \quad &= \aleph \times \{\delta(\text{momentum})\}^2
 \end{aligned}$$

Equation (13.) states that the energy, $\delta(\text{energy})$, expended by the force, over the period $\Delta(\text{time})$, upon each sink-hole within the object is proportional to the square of the resulting change in momentum, $\delta(\text{momentum})$, of each sink-hole during that period, $\Delta(\text{time})$. The constant of proportionality, $\aleph = 1/2k$, is a universal constant relating to the nature of the æther.

From the change in the sink-hole's momentum, $\delta(\text{momentum})$, it is possible to express the energy, $\delta(\text{energy})$, imparted by the force $\delta(\text{force})$, to the sink-hole in terms of the sink-hole's change in velocity, $\Delta(\text{velocity})$.

$$\begin{aligned}
 \delta(\text{energy}) &= \{1/2k\} \times \{\delta(\text{momentum})\}^2 \\
 \text{Since } \delta(\text{momentum}) &= k \times \Delta(\text{velocity}) \\
 \text{then } \delta(\text{energy}) &= \{1/2k\} \times \{k \times \Delta(\text{velocity})\}^2 \\
 &= \frac{1}{2} \times \{1/k\} \times k^2 \times \{\Delta(\text{velocity})\}^2 \\
 &= \frac{1}{2} \times k \times \{\Delta(\text{velocity})\}^2 \\
 14. \quad &= \beth \times \{\Delta(\text{velocity})\}^2
 \end{aligned}$$

I use the Hebrew letter \beth to encapsulate distinctively the part of the equation that is simply a restructuring of the universal constant \aleph which, in turn, is simply a restructuring of what I have conceptualized as the *coefficient of inertia* of a single ætherial sink-hole. In other words, \beth is a universal constant relating to the nature of the æther. Thus, by a simple re-rationalization of the units of measure, \beth could be deemed dimensionless, giving energy the nature of a squared velocity.

Notion of Squared Velocity

I have difficulty in conceptualising square-velocity. In conventional LMT analysis square-velocity would be $L^2 T^{-2}$. It would be measured in square metres per square second. Square metres I can visualise. But square seconds are beyond me. There are obviously other ways of interpreting square-velocity. However, I prefer to think of it in the only way that makes sense to my spatial intuition.

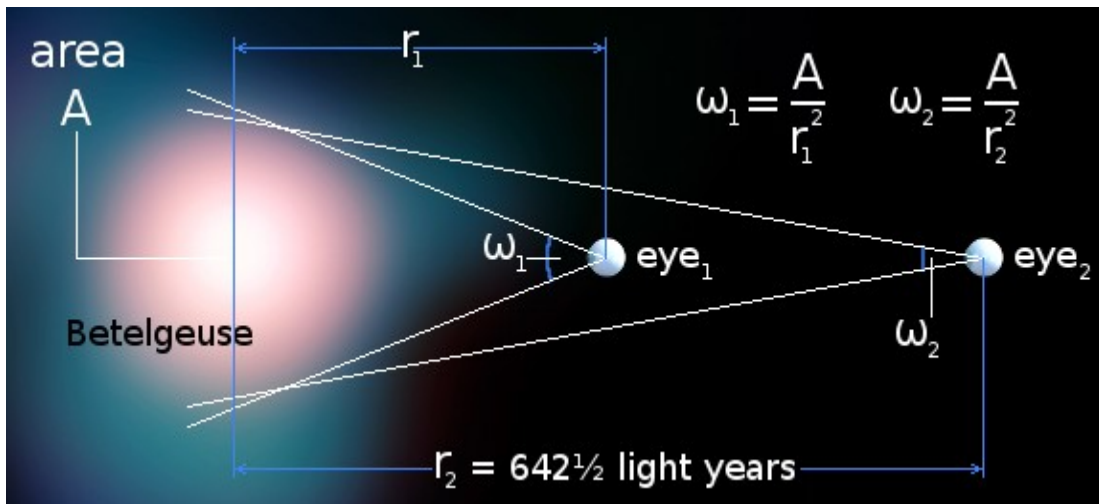
Time is nearly always represented graphically by a length. It is generally shown as the horizontal axis on a graph. It is not surprising, therefore, that it eventually became thought of as a fourth dimension, which could be treated in exactly the same way as the 3 space dimensions. Notwithstanding, time is not conceptually the same as a space dimension. In fact, it has jurisdiction in all 3 dimensions of space.

Consequently, my intuition does not see time like a fourth dimension of space. The expression $L^2 \times T^{-2}$ is the same as $L^2 \div T^2$. It is a spatial area (a tangible notion) divided by a temporal area (an area of time), which I can't imagine. So, although the mathematical expression T^2 symbolizes a square in time, the tangible reality behind the symbolism must be radically different.

The expression $L^2 \div T^2$ is the same, mathematically, as $L^2 \div T \div T$, which would be measured in square-metres per second per second. This I can picture. I see an expanding area whose rate of expansion is increasing with time. In other words, the rate of growth in the size of the area is increasing at a constant rate.

Has The Character of a Wave

When an electromagnetic source writes onto a non-radially-symmetrical flux of æther, the inscription occupies a certain area of the plain perpendicular to the direction of the flux. This area is in the form of a spherical cap, whose spherical centre is at the observer. I illustrated this in a previous essay in the example of the star Betelgeuse, as reproduced below.



If Betelgeuse is at a distance r from the observer, the area of the sphere of radius r , centred at the observer, $A = 4\pi r^2$. Since the æther upon which the inscription is written, is falling towards the observer at velocity c , The area of the sphere decreases as follows.

Area of the sphere	$A = 4\pi r^2$
Rate of change of A	$dA/dt = 8\pi r \times dr/dt$
But	$dr/dt = c$ [which is a constant]
Therefore	$dA/dt = 8\pi r \times c$ $= 8\pi cr$
Rate of change of dA/dt	$d^2A/dt^2 = 8\pi c \times dr/dt$ $= 8\pi c \times c$ $= 8\pi c^2$ [which is a constant]

The area of the sphere thus diminishes at a rate of $8\pi c^2$ square metres per second per second. The spherical cap, bearing the electromagnetic inscription, is geometrically part of this sphere. Its area therefore collapses at the same rate of $8\pi c^2$ square metres per second per second, as it falls towards the observer at velocity, c .

From this, I am able to acquire a conception of what square seconds are. They are, in this case at least, rates at which length is decreasing in two independent space dimensions, namely, decrements in $\Delta(\text{latitude})$ and $\Delta(\text{longitude})$ upon the spherical surface of the collapsing wave-front.

Side Note: In general, I don't see that the rates have to be the same in both the space dimensions concerned. They could be different in each. This invokes within my mind the notion that time can have as many independent dimensions as can space, namely 3.

The constant velocity, c , the velocity of light, is currently thought to be 299,792,458 metres per second. The area of the spherical wave-front must thus collapse towards the observer at the decelerating rate of $2.258818134 \times 10^{18}$ square metres per second per second. This certainly invokes within my mind the notion of the energy of a wave *falling* 3-dimensionally, from its point of inscription onto the æther, convergently towards the observer.

Kinetic Energy is Relative

Thus it would seem that what is perceived by conventional science as *kinetic energy* has the algebraic form of a wave. So perhaps what is perceived as kinetic energy is really ætherial wave-energy. If so, it is not imparted to the object by the force. The object merely has the passive role of *transforming* the linear energy expended by the force into a compression wave in the æther. The object itself does not gain the imparted energy.

For example, a bullet fired from a rifle gives the impression that it inherently contains kinetic energy gained from its propellant. Within a terrestrial environment, this is unquestionably intuitive. Notwithstanding, when considered in the context of the universe as a whole, the bullet has been decelerated by the propellant from the points of view of as many bodies in the universe as those from whose points of view it has been accelerated. Hence, its energy, relative to the universe as a whole has not changed.

The bullet's target, being in the terrestrial environment, happens always to be one of those objects in the universe from whose point of view it has been accelerated. The energy liberated on the bullet's impact with the target results from the intense momentary force applied, through a very small distance, to the bullet by the target. This energy is nothing to do with the energy expended by the force of the propellant in accelerating the bullet in the first place. It is a separate transaction.

The energy, applied to the bullet by the propellant, is now an ætherial compression wave etched within the ætherial in-flows that are converging towards zillions of sink-holes throughout the universe. Likewise, the energy, applied to the bullet by the target, is now a different and separate ætherial compression wave etched within the ætherial in-flows that are converging towards the same zillions of sink-holes throughout the universe.

So Where Does This Energy Go?

During the period Δt , while the force is being applied, the object does not, as far as I am aware, suffer an increase in temperature. Consequently, any work being done by the force is not being accumulated by the object itself. The inertial reaction therefore cannot be *resistive*. It must be purely *reactive*. [I use these terms in the sense in which they are used in connection with electrical circuits.]

This suggests that the object is merely acting as a means of passing the force exerted by the Finger of God to something beyond the object, which is reacting, via the object, with equal and opposite force. The result is that the Finger of God has not perturbed the object, but has used the object as a means of creating a disturbance within the æther. In so doing, the Finger of God has perturbed the whole universe.

Notwithstanding, unlike the object, the universe is not a rigid structure. The æther, of which the universe is made, is more like a fluid. Consequently, when it is perturbed in one location, the effect of that perturbation is not instantly transmitted to its entirety. The disturbance must be progressively distributed to all its parts by riding, as ætherial compressions, upon the in-flows to the zillions of sink-holes throughout the universe.

Transferred to The Æther

My proposition is that the energy, exerted by the force, is transferred, by the object, to the surrounding æther. This energy thus becomes stored, as a compression, within all ætherial fluxes which are travelling radially asymmetrically with respect to the object. In other words, unlike an atom or a dipole, which inscribe transverse polarization stresses (electromagnetic waves) within the æther, an object directly accelerated by a mechanical force inscribes, instead, a longitudinal compression stress (an inertial wave) within the æther.

The work done by the force, in accelerating the object, is $\Delta(\text{energy}) = n \times \omega \times \{\Delta(\text{velocity})\}^2$, as given by equation 14, where n is the number of sink-holes in the object. This is absolute energy. It is not relative to anything. And, since the object itself does not accumulate any of this energy internally, it must all necessarily become transferred to the æther as an ætherial compression.

The total energy of this compression is naturally distributed throughout all æther that is flowing radially asymmetrically with respect to the object. Its energy is shared out among the passing ætherial in-flows of all the other sink-holes in the universe.

Corollary: If there were only one sink-hole in the universe then all æther would be flowing radially into it. If the Finger of God were then to exert a force upon it, the energy expended (work done) by the force would have nowhere to go except into the sink-hole itself. I conjecture that, in this case, the sink-hole would exhibit no reactive inertia, so no energy would be expended by the force.

Of course, it is not readily possible to ascertain what proportion of $\Delta(\text{energy})$ would be compressed into the ætherial in-flow to any given sink-hole. You would need to know the relative distances of all the sink-holes in the universe. Therefore, let us suppose that the amount of ætherial compression energy impressed, by the acceleration of the object, upon the ætherial in-flow to a given sink-hole be E .

The energy E is therefore inscribed into the spherical cap of the destination sink-hole's in-flowing æther. This spherical cap has a volume $V = (\omega\delta r)r^2$, as given by equation [i]. The energy density of the ætherial compression, within the confines of its spherical cap, is therefore $\rho = E/V = E/(\omega\delta r)r^2$. The energy E for the spherical cap is a constant. As the spherical cap then falls towards its destination sink-hole at velocity, c , its energy density, ρ increases at a rate of $d\rho/dt$.

$$\begin{aligned} \text{Energy density within cap: } \quad \rho &= E/V \\ &= E/\{(\omega\delta r)r^2\} \\ &= \{E/(\omega\delta r)\} \times r^{-2} \\ \text{Let the constant } \quad Q &= E/(\omega\delta r) \\ \rho &= Q \times r^{-2} \\ \text{Rate of change of density: } \quad d\rho/dt &= -2Q \times r^{-3} \times dr/dt \\ &= -2Q \times r^{-3} \times c \end{aligned}$$

$$= -2Qc/r^3$$

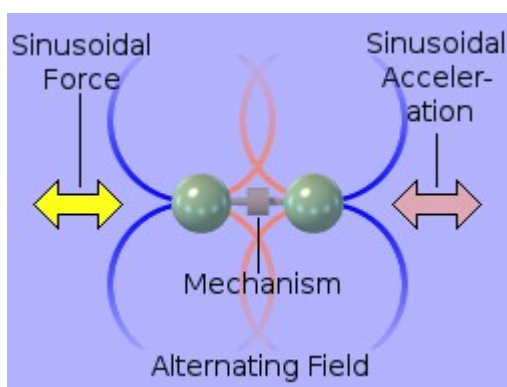
Further derivatives of the rate of change of ρ involve ever higher inverse powers of r . This shows that the rate of increase of energy density within the spherical cap, as it approaches its destination sink-hole, is highly non-linear. So the energy density within the spherical cap would seem to behave in the same way as the ætherial flux density. See [v] near the beginning of this essay. From this I conclude that the energy of the force exerted by the Finger of God, once transferred to the æther, falls inwards on itself, at an ever-increasing rate, as it proceeds at constant velocity, c , towards its destination sink-hole.

Compression Wave Generator

I have previously discussed the generation of an ætherial compression wave by accelerating the green steel sphere. I did not, however, discuss any practical way in which the necessary force should be applied to the sphere. In some examples I have mentioned a rocket and bullet propellant. These, however, both produce only short term transient accelerations. I need something more sustained and controllable. I also need a minimalist environment away from the sight and influence of other objects. To this end, I described the minimalist situation in which the necessary force was provided by the Finger of God. But the Finger of God is something hypothetical from outside the physical universe. I need a practical means of generating an ætherial compression wave. To do this, I must replace the Finger of God with something from within the physical universe.

I have also previously discussed the idea of generating an alternating ætherial compression wave by applying an alternating sinusoidal force to the green steel sphere. This would be sustainable and controllable. It would therefore be much easier and more precise to observe. However, I did not elaborate as to how this sinusoidal force would be produced or to what it would be anchored. I would now like to resolve these shortcomings and thereby specify a practical ætherial compression wave generator.

The only way to produce an ætherial compression signal, without resorting to the Finger of God, is to construct a dipole comprising two joined objects which will be accelerated equally but in mutual opposition.



My ætherial compression wave generator comprises two steel spheres joined together by a vibration mechanism, which alternately pushes the spheres apart and then pulls them together again according to a sinusoidal cycle. The force applied to one sphere is thus always equal and opposite to the force applied to the other sphere. The contours of constant compression gradient in the diagram are shown for the part of the cycle where the forces, as applied by the mechanism, are pushing the spheres apart.

The mechanism itself has the nature and characteristic of a solenoid supplied from a source of alternating current or a crankless double-pistoned internal combustion cylinder. Suffice it to say that it is powered from a compact source of stored mechanical, electrical or chemical energy. The whole assembly is, of course, located within my minimalist situation in free space beyond sight and influence of any other objects. It is alone in the universe.

The mechanism, using its internal source of stored energy, pushes the spheres apart and then pulls them together again in a continuous cycle until all its internal energy has been used up. The question this apparatus must answer is: "Where has the energy gone?". If it has gone into the steel spheres then their temperature should increase in accordance with the amount of energy expended by the mechanism, the specific heat of the material of which the spheres are made and the coefficient of radiation of the spheres' outer surfaces. If the temperature of the spheres does not rise in keeping with this prediction then either the Law of Conservation of Energy has been violated, or, the energy has gone somewhere else. If the latter, then, the spheres must have radiated the energy as some form of wave. If no electromagnetic radiation of sufficient power can be detected radiating from the spheres, then, clearly, the energy must have been radiated from the spheres as some other (unknown) kind of wave.

Obviously, it is not possible to construct an experiment in the minimalist situation I have just described. A more practical apparatus is needed. There are doubtless more efficient versions of the practical apparatus I shall describe. However, I feel that the apparatus I shall describe will be more efficient at demonstrating clearly what I am trying to show.

I propose a matched pair of powerful fully monitored diesel engines. Each drives its own separate and independent electrical generator. The output of one generator is used (perhaps temporarily) to power a university campus. The output of the other is used to power a giant solenoid to push and pull a pair of giant steel spheres in the way I have described. The spheres are each hung from a long steel hawser connected to a steel joist high above. This should minimize any friction associated with the movement of the steel spheres. The solenoid is water-cooled to prevent any heat transference to the spheres. The spheres are joined to the solenoid mechanism by rods made of a strong rigid material which is thermally non-conductive. The temperature of the spheres is monitored. The spheres are also monitored for any kind of electromagnetic radiation, especially around the frequency at which the spheres are being pushed and pulled by the solenoid. Electrical power consumption (in kW) of the campus is monitored, as is the electrical consumption of the solenoid. A control mechanism adjusts the power of the second diesel engine to make sure that the solenoid's consumption keeps up with that of the campus.

I speculate that neither any increase in temperature of the spheres nor any detected electromagnetic radiation from them will be able to account for the power consumption of the solenoid. I consequently speculate that the solenoid's power consumption must have been dissipated in the form of an as yet unknown kind of radiation, which I refer to as *ætherial compression radiation*.

The above experiment would produce - if indeed it is doing so at all - ætherial compression waves of the order of one cycle per second (1 Hz). But is this a sensible frequency to be investigating? I do not know. Perhaps frequencies in the megahertz or gigahertz or terahertz ranges would yield more information about the existence and nature of ætherial compression radiation. Perhaps, instead of large steel spheres, quartz crystals should be used in which the two opposing faces of the crystal are vibrated by applying a voltage across two other opposing faces.

Throughout the whole spectrum of ætherial compression radiation, the universe could be a very noisy place. The continuous acceleration and deceleration of molecules would create quite a lot of such noise. Notwithstanding, there could be frequency ranges where the universe is relatively quiet - like there is between 1 and 10 GHz for electromagnetic radiation. If so, ætherial compression waves within such a "quiet band" could be modulated with intelligence-bearing signals to provide an efficient means of communication.

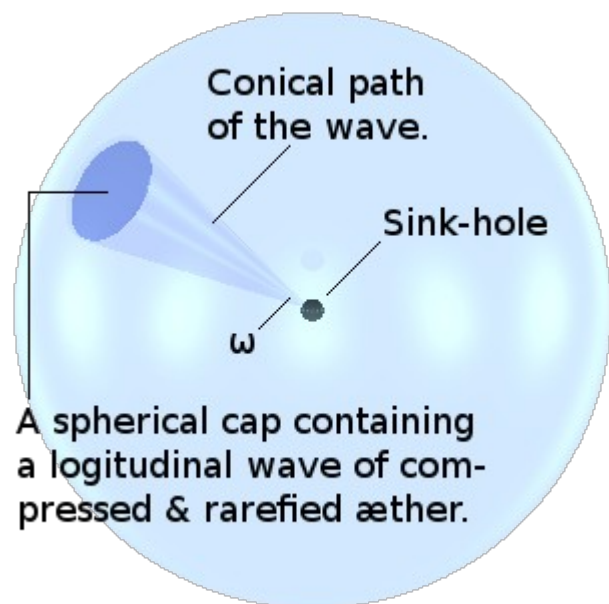
There is, however, a serious problem remaining. I have speculated that ætherial compression waves exist solely as a means of accounting for where the energy of the work done by the solenoid may have gone. I have not, so far, cited any instance of ætherial compression waves having been detected.

Is The Force-Wave Process Reversible?

The mechanism so far described is as follows. The Finger of God applies a force to an object. The object is thereby forcibly accelerated in the direction of the force. This causes the æther on the advancing side of the object to become compressed and the æther on the trailing side of the object to become rarefied, thus imprinting a compression-rarefaction wave upon all ætherial fluxes which are passing radially asymmetrically through the object.

I replaced the object with a dipole comprising two steel spheres. I also replaced the Finger of God with the diesel powered solenoid which joins the two steel spheres. As the dipole vibrates longitudinally, it imprints compression-rarefaction waves upon all ætherial fluxes which are passing radially asymmetrically through it. The question now is: will these ætherial compression-rarefaction waves perturb, in any way, the sink-holes into which these radially asymmetrical fluxes are converging?

The dipole, described above, imprints an ætherial compression wave into a minute spherical cap, as shown on the right. The cap is part of the sphere, centred on the destination sink-hole, the radius of which is the distance of the dipole from the sink-hole. The solid angle ω subtends the dipole from the destination sink-hole. The cap shrinks as it travels towards the sink-hole, at velocity c , along its conical path. The dipole imprints corresponding ætherial compression waves into similar spherical caps for all the sink-holes in the universe. Each collapsing cap is, in effect, a cone of sharply focused radial asymmetry within the ætherial inflow to its respective sink-hole.



The effect of the compression part of the converging wave is to cause the sink-hole to accelerate towards its source, namely, the dipole. Conversely, the effect of the rarefaction part of the converging wave is to cause the sink-hole to accelerate away from the dipole. If the dipole is under continuous power then the sink-hole will vibrate back and forth longitudinally in line with the direction of the dipole. Of course, the directional "radiation" profile of this mechanical dipole will have the same shape as that of an electric dipole. Consequently, sink-holes in line with the axis joining the steel spheres will be perturbed much more than sink-holes in the plane perpendicular to that axis.

This effect must be the same for all the sink-holes that make up the material of a solid object. The ætherial compression-rarefaction waves created by the dipole should therefore cause a solid object to vibrate (accelerate) back and forth just like a single sink-hole. Notwithstanding, since the effect is acting equally upon all the sink-holes in the object, the object will feel no force. This is because the

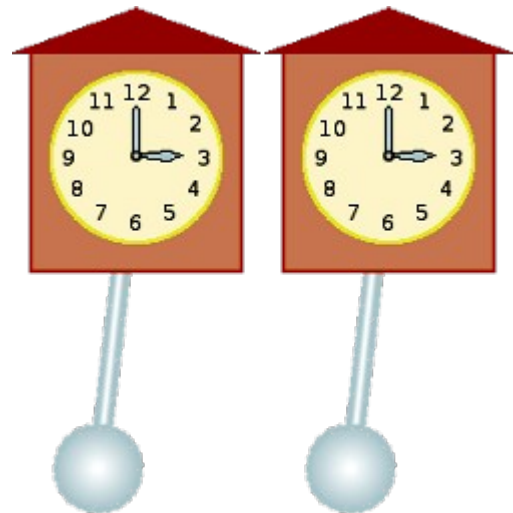
sinusoidal accelerations caused by the wave are inertial. They are not the result of the application of a real force to a point on the outer surface of the object, which is being transmitted through the material structure of the object to every sink-hole within it. Consequently, if the object were an observer, he would not feel that he was being accelerated back and forth.

An observer could not even gauge his accelerations by looking at a distant frame of reference such as a star field. What is perturbing him is the basic fabric of the universe. So whatever signals - electromagnetic or otherwise - he may be receiving from the star field, should be shifted to his own frame of reference in the process of arriving at his location. It would thus seem that the force-wave process is not reversible, leaving unanswered the question as to where the energy consumed by the solenoid has gone. Perhaps it is carried away as compression-rarefaction waves upon the æther and disappears into the sink-holes along with the æther upon which it is borne.

Notwithstanding all this, is it still possible, by any means, for a sentient object (an observer) to detect a compression wave arriving upon the ætherial in-flow of the sink-holes of which his material substance is composed?

Encouraging Evidence From The Past

A few generations ago, the pendulum clock was the norm. It was in this epoch that clock makers witnessed a remarkable phenomenon. All the pendulums of a group of identical clocks on a shelf, after they had been together for a long time, would be seen to be swinging in perfect synchronism. It is very unlikely that they would have started off that way. The clock maker could only set the clocks going one at a time. The swing of each pendulum would therefore start off in a random phase with respect to any of the others. It was as if there were some kind of mysterious linkage between the pendulums, which gradually pulled them into synchronism.



This phenomenon occurred with clocks whose pendulums were fully enclosed in glass panelled cases. The synchronism was not facilitated by air pressure waves. The clocks could also be on different shelves on opposite sides of the shop, provided their pendulums were swinging in line. So the synchronism could not be facilitated by vibrations transmitted by the material of the shelf.

It took a very long time for the pendulums of the clocks to synchronise, indicating that this mysterious coupling must be a very weak phenomenon. Notwithstanding, one must bear in mind that the operating frequency is very low. In the case of the pendulum clocks it is about one cycle per second (1Hz). Electromagnetic coupling at this frequency would also be extremely weak. Besides, the power applied to such a pendulum, to maintain its swing, is also extremely low. Consequently, the power of any resulting ætherial compression radiation would also be extremely low. Thus, the fact that the phenomenon is observable at all is quite amazing.

This albeit weak phenomenon does suggest that ætherial compression radiation, emitted by each pendulum, affects the others. This gives weight to the hope that an artificial receiver of ætherial compression signals might be possible.

Detecting an Ætherial Wave

Let us suppose the following. An ætherial compression-rarefaction wave arrives at a sink-hole on its ætherial in-flow. The sink-hole is one of many within the material substance of an object. The object is a sentient observer. How can this observer become aware of the event of the wave's arrival? Indeed, *can* he become aware of it or is this fundamentally impossible?

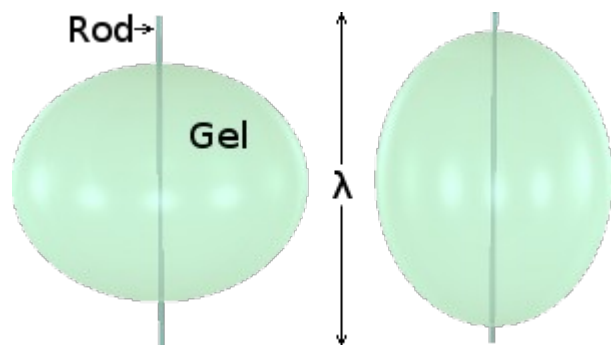
When an ætherial compression-rarefaction wave arrives at an object, the density of the æther is not radially symmetrical around that object. Consequently, the object must be in a state of directed acceleration - one way or the other in line with the origin of the wave - in the same way as it would be if a directed external force were acting upon it. In this case, however, the object itself feels no external force because the wave acts equally upon all sink-holes within the object.

Notwithstanding, the object does suffer a sinusoidal acceleration. It would require an opposing directed external force, operating in antiphase, to counter the effect of the ætherial compression-rarefaction wave in order to keep the object stationary. We would have to imagine this counteracting force as being applied by the Finger of God. In other words it must be applied from outside any frame of reference within the observer's universe.

So, is it fundamentally possible to detect the arrival, at an observer, of an ætherial compression-rarefaction wave? Yes, provided the observe can somehow become his own absolute frame of reference. And the wave itself provides the means for the observer to do this.

I have assumed (rightly or wrongly) that an ætherial compression-rarefaction wave - like an electromagnetic wave - travels at the constant velocity, c . Consequently, like an electromagnetic wave, it has a wave-length, λ . This means that the compressed æther enters sink-holes nearer the source before it enters sink-holes further from the source. Consequently, sink-holes nearer the source suffer accelerations towards the source before sink-holes further away suffer them. There is thus a variation in the accelerations suffered by adjacent sink-holes within the material of the object along the wave-length of the ætherial compression-rarefaction wave in line with the source. A means is required for detecting this variation in sink-hole acceleration with distance within the object.

A possible detector of this phenomenon could be a sphere of gel with a thin solid rod through a diameter in line with the source. For maximum sensitivity, the rod should be through the diameter of the gel sphere in line with the direction along which the ætherial compression-rarefaction wave is approaching. The gel sphere would compress and elongate as the wave progressed along the rod.



As the compressed æther enters the sphere, the gel squashes as if it were spinning. As the trailing rarefied æther enters the sphere, the gel elongates like a sausage. The squashing and elongating of the gel sphere could be gauged against the length of the solid rod, which could not be deformed by the passing wave simply because it is solid.

The links between the atoms in the gel of the sphere and in the metal of the rod both exert real reactive forces against the inertial force exerted on each sink-hole by the asymmetry in ætherial density created by the wave. However, detection is made possible by the fact that the real reactive

force exerted within the gel is less than the real reactive force exerted within the rod. Hence the relative movement between the gel and the rod.

As the wave enters successive sink-holes within the rod, the atoms therein are probably not perturbed much, so the rod does not deform to any significant degree. The atoms within the gel, on the other hand, are much more easily perturbed, so the gel deforms significantly. The momentary deforming of the gel sphere constitutes real forces moving through distances. Hence the gel must dissipate energy. Consequently, some of the energy expended by the source in etching the wave upon the passing æther, has been captured and thereby absorbed by the gel.

The essence of this detector is that ætherial compression affects some materials more than others. It affects the gel more than the solid rod. The two materials could be said to have differing coefficients of ætherial compressibility. Effectively, this difference in coefficients transduces a pair of non-detectable ætherial compressions into what the observer perceives as a detectable directed force between the gel and the measuring stick. However, one must be careful to note that the force concerned is a differential force: not an absolute one. It is the detectable difference between two undetectable forces that are members of the same mutually opposing couple. In other words, the detectable force is a pinching force, like that exerted by a pair of pliers, which cannot accelerate anything.

A Communicative Universe

The universe is, by definition, a single unified object. As such, all its parts - no matter how finely subdivided they may be - must be interconnected by *something*. I have called that *something* the æther. In fact, I have gone as far as to say that all features within the universe must be merely complex knots and convolutions within the fabric of the æther. This means that all objects (or more correctly, sub-objects) in the universe must be connected. And if connected, they are related. Thus there must exist a distinct *relationship* between every pair of objects within the universe.



As with two people, a relationship cannot exist between two objects without some form of communication taking place between them. Relationship cannot exist without communication. Consequently, any change in state suffered by one object must, by virtue of its being a part of the universe, be communicated to all other objects within the universe. In other words, a change in state suffered by one object within the universe, no matter how large or small that object may be, must necessarily and eventually be communicated to the whole of the universe. Thus, if an object be perturbed by a force, exerted by the Finger of God, then that event must eventually affect (be communicated to) the whole universe.

So the universe communicates within itself: between its different parts. When one object within the universe is perturbed by a directed external force, this perturbation will eventually affect all other objects within it. But those other objects will not perceive the effect as a directed external force. Each can only perceive a compressive or tensive opposing couple within its own internal structure.

This provokes an interesting question. Could this phenomenon be used to construct a means of symbolic telecommunication by modulating ætherial compression waves? A full-cycle ætherial compression wave could form the basic element of a Baudot-type data code. This means that ætherial compression waves could be used to convey information, which raises the possibility of what, in science fiction circles, might be termed sub-space transmission. Of course, a suitable

transmitter and receiver would have to be designed and built. Getting such a transmitter to send information is then simply a matter of modulating one's coded information upon the sinusoidal signal that drives the transmitting device - exactly as is done for electromagnetic signals today.

But what would make a suitable ætherial transmitting device? The clock pendulums involve low power, very low frequency and exhibit only very slight coupling. They probably would not work over a very long distance or at a usable speed. The diesel-powered steel spheres have very high power but, again, very low frequency. And I don't know whether or not they would exhibit any coupling with similar spheres some distance away. I wish I had the resources to experiment with apparatus capable of operating at vastly higher frequencies.

Perhaps a suitable apparatus for generating and modulating ætherial compression waves could exploit the piezoelectric effect in large quartz crystals - or perhaps arrays of crystals fed from a high-powered electronic oscillator fed by the diesel generator used to power the solenoid that moved the steel spheres. Within the Earth's atmosphere, over a wide range of frequencies, such piezoelectric crystals would emit waves of sound or ultra-sound. It is therefore necessary either to conduct the experiments in outer space or use frequencies beyond the range at which the materials of the atmosphere can react to mechanical compression waves.

Would the same kind of device also be able to receive intelligent signals modulated on an ætherial compression wave? Would a piezoelectric device, oscillating at 5GHz for example, cause a similar device to oscillate in sympathy. Perhaps, but I don't think this would be the best approach for receiving an intelligent signal modulated upon an ætherial compression wave.

According to my foregoing reasoning, an ætherial compression wave, arriving at such a detection device, cannot produce an externally directed force. It creates a pinch-couple of opposing forces. A detector (or receiver) for ætherial compression transmissions must therefore have the characteristic of the gel and stick device described earlier. Gel, however, will probably not work for high frequencies. Other suitable materials would have to be tested for reception in different parts of the ætherial compression wave frequency spectrum.

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