The Speed of Light

Frederick David Tombe
Belfast, Northern Ireland, United Kingdom
e-mail: sirius184@hotmail.com
18th March 2014

The aether (or electricity) is a fluid-like substance that is the stuff of all matter and space, and it flows constantly between positive and negative particles, with particles being merely aether sources and aether sinks. Space is densely packed with aether sinks (electrons) and aether sources (positrons). These electrons and positrons are paired into tiny dipoles. Within each dipole, the electron and the positron will undergo a mutual circular orbit. In the steady state, these tiny dipolar aether vortices will align with their neighbours according to two superimposed principles. Their rotation axes will mutually align and trace out solenoidal lines around a magnetic dipole. The resulting electron-positron double helix that winds its way around each such line is what causes the electrostatic tension that makes it into a 'magnetic line of force'. When large scale aether flow, constituting either an externally applied gravitational field or an electric current (electric field), is superimposed, the tiny vortices will become linearly polarized. This will result in a 'couple force' acting on the tiny vortices which will cause them to precess such that their precessional axes will be aligned with the externally applied field lines. Centrifugal pressure therefore acts at right angles to both magnetic and electric lines of force. In the dynamic state the alignment of the dipoles is undergoing change and the tiny dipoles will be angularly accelerating, either in magnitude or direction (precession). This realignment will be accompanied by a net vortex flow of pressurized aether that passes between neighbouring dipoles. This net flow of momentum is electromagnetic radiation, and it has a wave-like nature, in that the flow will constantly be emerging from positrons and sinking into electrons. The average speed of this flow is what determines the speed of light.

1. Escape Velocity

The escape velocity in a radial force field such as a gravitational field is the velocity that cancels with the aether inflow velocity. In the case of an electron in mutual orbit with a positron, the escape velocity will be the average speed of the aether as it flows from positron to electron. There is however an additional complication which doesn't arise in planetary orbital analysis. E.T. Whittaker [1] wrote

" - - - All space, according to the younger [John] Bernoulli, is permeated by a fluid Aether, containing an immense number of excessively small whirlpools. The elasticity which the Aether appears to possess, and in virtue of which it is able to transmit vibrations, is really due to the presence of these whirlpools; for, owing to centrifugal force, each whirlpool is continually striving to dilate, and so presses against the neighbouring whirlpools - - -"

In the electron-positron sea, which we will call "*The Electric Sea*", the rotating electron-positron dipoles are pressing against each other with centrifugal force while striving to dilate. The electrons and positrons in each dipole are therefore being hemmed in by the inward centrifugal pressure that is coming from their neighbours in the equatorial plane. Gyroscopic stability as well as the fact that the dipoles are bonded, positive to negative, along the double helix in the axial direction [2], will ensure that, in the steady state, the centrifugal pressure in the equatorial plane does not cause the dipoles to tumble over in their attempt to escape the pressure. The significance of this is that the circumferential velocity of the electrons and positrons in the tiny dipoles may have already reached their escape velocity, even though they are still confined to a closed circular orbit. It will be proposed in the next section that this circumferential speed, which will be dependent on the diameter of the dipoles, is in fact the speed of light, and that therefore the average speed of aether flow between neighbouring dipoles in any direction will be that same speed. Hence in the dynamic state, when dipoles are caused to angularly accelerate while realigning due to the external torque that comes from the pressurized vortex aether flow that constitutes electromagnetic radiation, this net aether flow will be travelling at the same speed as the speed of circulation of the rotating dipoles themselves. In the 1937 Encyclopaedia Britannica article entitled '*Ether (in Physics)*', and written by Sir Oliver Lodge, [3] he states in relation to the speed of light,

"*The most probable surmise or guess at present is that the ether is a perfectly incompressible continuous fluid, in a state of fine-grained vortex motion, circulating with that same enormous speed. For it has been partly, though as yet incompletely, shown that such a vortex fluid would transmit waves of the same general nature as light waves − i.e., periodic disturbances across the line of propagation − and would transmit them at a rate of the same order of magnitude as the vortex or circulation speed.*"

Apart from the bit about the aether being incompressible, this statement would appear to be essentially correct.

2. Newton and $E = mc^2$

Let us consider the elasticity of a single rotating electron-positron dipole of radius h. In Maxwell's 1861 paper entitled '*On Physical Lines of Force*' [4], Hooke's law appears at Eq. (105) in the form,

$$R = -4\pi E^2 h \qquad \text{(Electric Displacement Equation)} \qquad (1)$$

where R is electromotive force, E is the dielectric constant, and h is displacement. These symbols are identical to those used by Maxwell for ease of comparison with Maxwell's original paper.

If we consider the electric sea to be uniformly dense with the distance between neighbouring dipoles being in the same order of magnitude as the dimensions of the dipoles themselves, then these dipoles will be pressing against each other with centrifugal force while striving to dilate in their equatorial planes. This centrifugal pressure between neighbouring dipoles will be the source of the elasticity, and since neighbouring dipoles will all be spinning in the same direction, the effective speed for the purposes of centrifugal potential energy will be the mutual transverse speed, which will be twice the circumferential speed. Centrifugal potential energy is the same thing as transverse kinetic energy, and summed over the two particles of the dipole this will be equal to $m(2v)^2$, or $4mv^2$, where $2m$ is the combined mass of the two particles, and where v is their circumferential speed. Mass is considered to be a measure of the amount of aether. This centrifugal potential energy will be equal to the maximum linear kinetic energy as when the circular motion is resolved along a diameter. This resolved linear motion, being a simple harmonic motion, in turn will be equal to the maximum potential energy that we obtain from Hooke's law. Since we are dealing with shared elasticity over the two particles within the dipole, this maximum potential energy will be $2\pi E^2 h^2$. Therefore

$$4mv^2 = 2\pi E^2 h^2 \qquad (2)$$

and hence

$$2mv^2 = \pi E^2 h^2 \qquad (3)$$

The centrifugal potential energy, $4mv^2$, is the resultant of an inward centrifugal force and an equal and opposite outward centrifugal force. As such, if we double the outward centrifugal force we will split the dipole. The input energy needed to split an electron-positron dipole is therefore $2mv^2$. We also know from the 1932 Carl D. Anderson experiment that this energy is the 1.02 MeV associated with Gamma radiation, and that it corresponds exactly to $2mc^2$, where c is the speed of light. [5]

Hence it follows that the circumferential speed of the electrons and positrons in the dipoles of the electric sea is equal to the speed of light [5], and that,

$$c^2 = E^2 / \mu \qquad (4)$$

where μ is the areal density, $2m / \pi h^2$, of an electron-positron dipole. Eq. (4) is equivalent to the Eq. (135) in Maxwell's 1861 paper, which he derived from Newton's equation for the speed of sound at Eq. (132), and it is more familiar nowadays in the form,

$$c^2 = 1/\varepsilon\mu \qquad (5)$$

where ε is the electric permittivity and where μ is the magnetic permeability. By multiplying the top and bottom lines of equation (4) by area, we end up with,

$$\mathbf{E} = mc^2 \qquad (6)$$

where $\mathbf{E}$ is the centrifugal potential energy. Gilbert Lewis derived equation (6) from Maxwell's equation for radiation pressure [6].

Maxwell never knew the size of his molecular vortices, but it would be reasonable to assume that they are small enough to flow through the interstitial spaces between the atoms and molecules of ponderable matter, as like water flows through a basket. We could assume that the circumference of these dipolar vortices is equal to half of the Compton wavelength for an electron, since gamma radiation of this wavelength, or lower, can resonate with the dipoles and split them apart, as has just been explained above. This would make their diameter 0.3863 picometres, hence setting them at about one thousandth the size of the average atom. The density of the vortex sea will however be difficult to calculate because the balance between the electrostatic force in the axial direction and the centrifugal force in the equatorial plane would point to inter-particle spacings between neighbouring vortices on the femtometre scale. Since this is very much less than their actual diameters, the magnetic lines of force will in effect become *tubes of force*. Then on the issue of the density, as an absolute minimum, if we were to simply consider only the diameter of the vortices, the density of the vortex sea will already be into the region of fourteen hundred times denser than lead, but it will surely be many orders of magnitude yet higher than that still.

3. Repulsion between two Sinks

Two sinks will attract each other providing that the flow is perfectly irrotational. The introduction of curl or vorticity into the flow creates pressure which can undo any tension in the irrotational flow. This is the fundamental principle behind centrifugal force and the convective forces generally. In the case of large scale charged bodies, the aether flow is predominantly irrotational because of the presence of the tiny dipolar vortices that fill all of the surrounding space. The tiny vortices absorb the large-scale vorticity into the background magnetic field. The large-scale flow in turn causes the tiny dipoles to become linearly polarized. This is because the positive sources will be pushed along in the aether flow whereas the negative sinks will eat their way in the opposite direction towards the source of the flow. There is however an additional complication which arises because the dipoles are rotating, and this has the effect of introducing a 'couple force' which causes the dipoles to precess with their preces-

sional axes aligned parallel to the large-scale flow. Hence a centrifugal pressure will act at right angles to the flow lines. This centrifugal pressure can have the effect of pushing two sinks apart. Coulomb's law and Newton's law of gravitation apply to the force that acts in the direction of the field lines, however there is an additional repulsive force acting at right angles to the field lines which is caused by fine-grained centrifugal force. This fine-grained centrifugal force in turn causes a centrifugal force on the large scale. The attractive force that acts between two sinks due to the tension in the large scale aether flow is undermined by this perpendicular centrifugal pressure, and if the flow is strong such as to cause a fast fine-grained precession in the lines of force, this will cause a strong centrifugal force to act at the interface between the two sinks, so as to push them apart. Alternatively, a mutual transverse velocity between the two sinks will cause an angular acceleration of the tiny dipoles at the interface. This transverse shearing effect will hence induce a greater centrifugal force, and it is this mechanism that keeps the planets in their orbits and prevents them from falling into the Sun.

4. Conclusion

In an unpublished paper entitled "Man's Greatest Achievement", Nikola Tesla wrote [7],

 "Long ago he (mankind) recognized that all perceptible matter comes from a primary substance, or tenuity beyond conception, filling all space, the Akasha or luminiferous ether, acted upon by the life giving Prana or creative force, calling into existence, in never ending cycles all things and phenomena. The primary substance, thrown into infinitesimal whirls of prodigious velocity, becomes gross matter; the force subsiding, the motion ceases and matter disappears, reverting to the primary substance."

The disappearance of the aether in the twentieth century in conjunction with the relativity revolution has left modern physics totally handicapped. The belief that centrifugal force is not a real force is part of this same culture that rejects absolutes, yet without both the aether and centrifugal force, we lose those very physical lines of force that explain the mechanism behind Maxwell's equations, force fields, and the electromagnetic wave propagation mechanism. Modern physics did however retain Maxwell's equations in their outward form, but devoid of their inward physical rationale. It is taught that Maxwell's equations follow on from Einstein's theories of relativity, despite that fact that it is patently obvious that Maxwell and Einstein were not remotely working along the same lines. Maxwell's electromotive force equation,

$$\mathbf{E} = -\nabla\Psi - \partial\mathbf{A}/\partial t + \mathbf{v}\times\mathbf{B} \qquad (7)$$

where Ψ is the scalar potential and $\mathbf{A}$ is the vector potential or electromagnetic momentum, first appeared as equation (77) in his 1861 paper, and later appeared as equation (D) in his original list of eight 'Maxwell's Equations' in his 1865 paper '*A Dynamical theory of the Electromagnetic Field*' [8]. However, this equation is introduced in modern textbooks under the misleading name of '*Lorentz force*' as if it were an additional equation that Maxwell

had overlooked. Meanwhile the convective term, $\mathbf{v}\times\mathbf{B}$, in equation (7) has been totally disassociated from its very cause, which is the convective effect in the aether that induces the pressure. Maxwell's '*Displacement Current*' is justified in the modern textbooks, not in terms of the physical displacement of the particles in the aether as Maxwell himself had explained, but rather in terms of a flawed argument surrounding conservation of charge in a total vacuum. A fundamental principle that has been lost as a consequence of the relativity revolution is the principle that a line of force superficially resembles a wind tunnel that is lined with turbines. The wind causes the turbines to rotate and hence to generate a centrifugal force at right angles to the wind.

It is the perpendicular force which has been lost in modern physics. This perpendicular force is centrifugal force, and it is responsible for inducing motion in a current carrying electric wire in a magnetic field, for preventing a gyroscope from toppling under gravity, for reversing the angular momentum in a rotating rattleback, and for preventing the planets from falling into the Sun. It is also the cause of magnetic repulsion, as well as being the cause of the repulsive effect that acts perpendicularly from the field lines in cases of electrostatic repulsion.

The speed of light is related to the centrifugal pressure, and hence the energy, in the background electric sea. This in turn is determined by the aether inflow and outflow rates through the positrons and the electrons, and also by their angular momentum.

References

[1] Whittaker, E.T., "A History of the Theories of Aether and Electricity", Chapter 4, pages 100-102, (1910)
[2] Tombe, F.D., "The Double Helix Theory of the Magnetic Field", General Science Journal, (2006)
http://gsjournal.net/Science-Journals/Research%20Papers-Mathematical%20Physics/Download/6371
[3] Lodge, Sir Oliver J., "Ether (in Physics)", Encyclopaedia Britannica, Fourteenth Edition, Volume XIII, Pages 751-755, (1937)
http://gsjournal.net/Science-Journals/Historical%20Papers-Mechanics%20/%20Electrodynamics/Download/4105
[4] Clerk-Maxwell, J., "On Physical Lines of Force", Philosophical Magazine, Volume XXI, Fourth Series, London, (1861)
http://www.vacuum-physics.com/Maxwell/maxwell_oplf.pdf
[5] Simhony, M., "*The Electron-Positron Lattice Space, Cause of Relativity and Quantum Effects*", Physics Section 5, The Hebrew University, Jerusalem (1990)
http://web.archive.org/web/20040606235138/www.word1.co.il/physics/mass.htm
[6] G.N. Lewis, "A Revision of the Fundamental Laws of Matter and Energy", Phil. Mag. **16**, 705-17, (1908)
[7] O'Neill, John J., "PRODIGAL GENIUS, Biography of Nikola Tesla", Freeport, Long Island, New York, 15th July 1944, Fourth Part, paragraph 23, quoting Tesla from his 1907 pper **"Man's Greatest Achievement"** which was published in 1930 in the Milwaukee Sentinel,
http://www.rastko.rs/istorija/tesla/oniell-tesla.html
http://www.ascension-research.org/tesla.html

[8] Clerk-Maxwell, J., "A Dynamical Theory of the Electromagnetic
Field", Philosophical Transactions of the Royal Society, 155, pp
459-512 (1865). Abstract: Proceedings of the Royal Society of
London 13, pp. 531--536 (1864)
https://www.researchgate.net/publication/302966559_Maxwell's_Original_Equations
http://www.zpenergy.com/downloads/Maxwell_1864_3.pdf