

## **The Aether in Rigid Body Collisions**

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**Abstract. During a collision, momentum is always conserved. The large scale kinetic energy on the other hand, may or may not be conserved.**

**When kinetic energy on the large scale is conserved during a collision, we say that the situation is matched. It will be concluded that a matched collision involves only a large scale pulse of aether with a prodigious speed that is many orders of magnitude greater than the speed of light, and probably even instantaneous. An unmatched collision on the other hand will involve both a large scale aether pulse as well as a microscopic particle compression wave with a finite speed in the order of the speed of sound.**

**This aether pulse, which we will call a vitreous pulse, is a compression wave of aether involving an actual net aether flow that moves through a rigid body and causes large scale acceleration. This large scale acceleration is due to an aethereal force which we will call G5.**

### **The Four Fundamental G Forces**

**I. We saw in section III of ‘Gravitation and the Gyroscopic Force’ at,**

**<http://www.wbabin.net/science/tombe5.pdf>**

how aether hydrodynamics points to four fundamental forces. Let us take a closer look at these four forces.

**G1** is the inverse square law force associated with radial irrotational aether flow in spherical symmetry. It is the force associated with gravitation, magnetic attraction, electrostatic attraction, and also with electrostatic repulsion in cases involving positive charge (outflow). This effect implies the existence of unseen forces that cause the aether to flow out of point sources and into point sinks.

**G2** is centrifugal force. It is generally associated with repulsion. It is the cause of the outward radial force in planetary orbital theory and the force associated with magnetic repulsion. It is also the cause of electrostatic repulsion in cases involving vitreous and resinous charge. **G2** is the force that causes inertia in the local Cartesian frame of reference, and hence Newton's 1<sup>st</sup> law of motion.

**G3** is the Coriolis force. It is associated with the cyclonic behaviour in the weather patterns and in the ocean currents. This could be due to either or both fine-grain vorticity in the magnetic field or large scale vorticity of the aether due to the Earth's diurnal rotation. The **G3** force is also the force that prevents a pivoted precessing gyroscope from toppling over and it is also the root cause of the  $\mathbf{v} \times \mathbf{B}$  force of electromagnetic induction.

(The force that reverses the direction of a spinning rattleback in conjunction with rolling friction is probably an obscure hybrid of **G2** and **G3** which occurs in rigid body dynamics. See [1], [2], and 'Fundamental Torque and the Rattleback' at, <http://www.wbabin.net/science/tombe37.pdf>)

**G4** is the angular  $\partial \mathbf{A} / \partial t$  force. It is associated with electromagnetic induction. However, it is unlikely that angularly accelerated aether would ever occur in the natural state of affairs. It has been suggested in 'Fundamental Torque and the Rattleback' at,

<http://www.wbabin.net/science/tombe37.pdf>

that it is actually the **G2** force that underlies the  $\partial \mathbf{A} / \partial t$  term in electromagnetic induction.

## The Scalar and Vector Potentials

II. Equation (77) in Maxwell's 1861 paper 'On Physical Lines of Force',

[http://vacuum-physics.com/Maxwell/maxwell\\_oplf.pdf](http://vacuum-physics.com/Maxwell/maxwell_oplf.pdf)

which is known nowadays as the Lorentz force, contains the terms  $\text{grad}\psi$  and  $\partial\mathbf{A}/\partial t$ .

Maxwell identified the vector potential  $\mathbf{A}$  with momentum and he believed that it corresponded to Faraday's *electro-tonic* state. In previous articles,  $\mathbf{A}$  has been referred to as a vector closely related to aether field velocity. When considering the weighting for aether density, Maxwell's idea that  $\mathbf{A}$  is a momentum is perhaps somewhat more accurate.

Regarding the scalar potential term  $\psi$ , Maxwell states that "*The physical interpretation of  $\psi$  is, that it is the electric tension at each point in space*".

Maxwell went on to derive a particular solution for  $\text{grad}\psi$  at equation (127). This particular solution is Coulomb's inverse square law of electrostatics, with electric charge defined as the density of 'free electricity'. This particular solution corresponds to the  $\mathbf{G1}$  radial hydrodynamical force which is associated with aether flowing into sinks and out of sources.

In general we will have a force associated with aether pressure or aether tension given by the equation,

$$\text{grad}\psi = \partial\mathbf{A}/\partial t \quad \text{(The Aethereal Induction Equation)} \quad (118)$$

The equation,

$$\text{div } \mathbf{A} = \partial\psi/\partial t \quad \text{(The Equation of Continuity)} \quad (113)$$

is the equation of continuity because  $\mathbf{A}$  is the same thing as electric current and  $\psi$  is effectively the same thing as electric charge since charge and potential are both measures of the pressure or the tension in the aether. If we combine equation (118) with equation (113) we obtain an aether wave equation,

$$\nabla^2 \psi = \partial^2 \psi / \partial t^2 \quad (\text{The Aether Wave Equation}) \quad (\text{A})$$

which doesn't specify a propagation speed.

### The Lorenz Gauge

**III.** The Lorenz gauge is the equation of continuity (113) above with the speed of light arbitrarily incorporated. Maxwell naturally disapproved of the Lorenz gauge because it was a clear cut case of cooking the books. We don't know what speed compression pulses travel at through the aether. Maxwell avoided this problem by carefully eliminating the Coulomb force when he first derived the electromagnetic wave equation in part VI of his 1865 paper 'A Dynamical Theory of the Electromagnetic Field'. See page 497 (page 9 of the pdf file) at,

[http://www.zpenergy.com/downloads/Maxwell\\_1864\\_4.pdf](http://www.zpenergy.com/downloads/Maxwell_1864_4.pdf)

The speed of light which Maxwell obtained for the electromagnetic wave equation applies specifically to the propagation of angular acceleration through the molecular vortices as described by the magnetic **H** vector. This is a particle compression wave effect of finite speed and it tells us nothing about the actual speed of compression waves in the aether itself.

There is a tendency for people to try and understand collisions between rigid bodies in terms of inter-molecular compression waves travelling at finite speeds of the order of the speed of sound for the material in question. However, such inter-molecular waves inside a rigid body cannot on any account explain large scale motion of the body as a whole.

A rigid body collision involves an aethereal compression pulse which acts to cause acceleration on the large scale. This pulse travels through suitable conducting media at an unknown speed which is prodigious if not infinite. This pulse can release its stress by causing large scale acceleration if it is prevented from moving beyond the medium.

**G5** will be used to refer to the  $\text{grad}\psi$  force for general situations that involve the discharge of aether pressure into large scale kinetic energy.

## Pressure and Tension in the Aether

IV. In ‘Fundamental Torque and the Rattleback’ at,

<http://www.wbabin.net/science/tombe37.pdf>

it was discussed how the centrifugal force at the fine-grain level can lead to aether compression and hence the **G5** force.

When aether pressure is caused by centrifugal force acting between the tiny vortices in the aether, centrifugal potential energy gradually blends into vitreous charge  $\psi$  associated with aether compression and the **G5** force. Centrifugal potential energy is very closely related to kinetic energy and the two concepts can overlap in the case of tangential motion. See ‘Vitreous Charge and Centrifugal Potential Energy’ at,

<http://www.wbabin.net/science/tombe25.pdf>

## Mechanical Matching

V. Consider a row of metal balls of equal size and weight, all touching each other as is the case in the Newton’s cradle. If we cause another similar ball to collide into the row at one end, it stops still abruptly and another ball accelerates away at the far end with a final momentum and a final kinetic energy equal to what the first ball had just prior to the collision. The situation is said to be matched.

Newton’s 3<sup>rd</sup> law of motion appears to have been defied at the impact point because no reaction appears to have taken place at that point, unlike what would have occurred if the row of balls had all been soldered together. The incoming ball stops still, and another ball moves on at the end of the row. It is almost as if the incoming ball was carrying a spirit that departs from it on impact, passes through the row of balls, and enters the outgoing ball at the far end, carrying it away. There was an element of knowingness of the fact that the balls weren’t all soldered together.

We need to enquire into how Newton’s 3<sup>rd</sup> law of motion seems to be defied at the initial impact point. We will assume that the incoming ball is halted by a mutual intermolecular repulsive force. Why did the entire row

of balls not move off together in line with Newton's 3<sup>rd</sup> law of motion at the time of the impact?

We must look to the connection between kinetic energy and vitreous charge. Planetary orbital theory is based on the interplay between the two irrotational forces **G1** and **G2**. There is a cyclic alternation between potential energy and kinetic energy. However, as a planet accelerates through the aether its internal structure should be undergoing linear polarization. This in turn will lead to an internal fine-grain centrifugal potential energy accumulating. Hence increasing kinetic energy of a rigid body on the large scale will be associated with an increasing internal aether pressure (and hence an actual increase in mass).

When the incoming metal ball collides with the row, it will possess a higher aether pressure than the other stationary balls in the row. This aether pressure will be released into the stationary ball at the moment of impact. But instead of a mutual repulsion occurring, a pressurized aether wave will carry on through the row of balls to the far end, with the row of balls acting as a conducting medium as like the wire of an electric circuit. The incoming ball will lose its vitreous charge and remain at rest at the beginning of the row with its aether content now reduced to normal levels. The ball at the other end of the row will absorb the excess aether rather than allowing the excess aether to escape, and a **G5** force will be induced according to the equation,

$$\text{grad}\psi = \partial\mathbf{A}/\partial t \quad (\text{The Aethereal Induction Equation}) \quad (118)$$

Newton's 3<sup>rd</sup> law of motion will not have been defied because the force will simply have been transmitted at-a-distance, probably instantaneously, to the far end of the row by the vitreous aether pulse. This vitreous pulse will have actually carried a net amount of aether from the incoming ball to the outgoing ball.

If we were now to solder the two end balls together and repeat the above experiment, it would be impossible for the situation to allow for conservation of kinetic energy on the large scale, because the situation will now be unmatched. When the vitreous pulse arrives inside the end ball, that ball will start to move away. However, because it is soldered to its neighbour, it will pull its neighbour with it by the intermolecular attractive **G1** bonds. This pull effect will result in the newly arrived aethereal energy being split between the large scale translational motion and the microscopic internal motions of the molecules. Energy will hence not be conserved as viewed on the large scale.

## Pushing a Long Rigid Pole

**VI.** Collision forces in general will involve both the large scale vitreous pulse and microscopic particle level elasticity working together in tandem. Consider a row of metal balls joined together by springs and resting on a horizontal surface. The variables will be mass, surface friction, air resistance, and spring constant. If we push the ball at one end, the entire row will engage in two independent motions. There will be a motion of the entire row on the large scale, and also an internal wave motion with finite propagation speed depending on the above variables. The motion will be divided between large scale ‘slide’ and internal compression and rarefaction waves. The relative degree of each motion will depend on the values of the variables mentioned above. At any rate, the internal wave motion will have a finite speed, but the large scale motion of the entire row will be transmitted either instantly to every point or at the indeterminate prodigious speed associated with aether waves.

An extreme case of this scenario is if we were to push the end of a long rigid pole. The far end of the pole will move at exactly the same time as the contact end moves. This implies that the push involves direct aether compression. We can therefore conclude that a net transfer of aether occurs every time that a large body causes another large body to move by contact force.

It is a common mistake to link the large scale motion of a rigid body to the speed of the internal particle compression waves. This mistake is in large part due to the inability of people to accept the concept of action-at-a-distance. The Lorenz gauge is an example of fudging due to inability to accept the concept of action-at-a-distance. But there is no manner in which the internal molecular vibration waves in a rigid body can suddenly translate into motion on the large scale on reaching one end of a rigid body.

## Analogy with Electric Current

**VII.** The mechanical scenario above has got an analogy with electric current. The action-at-a-distance aethereal effect is equivalent to the translational motion of electric particles through a wire, since the electric particles in the wire are being subject to the aethereal action-at-a-distance  $\partial\mathbf{A}/\partial t$  force. However, the lossless electropolarization (TEP) waves of linear displacement current associated with the internal elasticity of the charge carriers will have a finite propagation speed. See ‘Electrical Arcing and Action-at-a-Distance’ at,

<http://www.wbabin.net/science/tombe27.pdf>

The turns ratio of the coils in an AC transformer will decide the split ratio between the magnitude of the standard translational kinetic energy current on the one hand, and the magnitude of the elastic displacement current in the TEP wave on the other hand. The latter is considered to be voltage or tension.

A rectangular TEP pulse propagating in the space between the two wires of a transmission line is an example of a situation that involves both large scale motion of aethereal kinetic energy, and fine grain elastic wave motion of the electric particles of the electric sea [3]. It is an electrical analogy to the sliding row of metal balls that are joined together with springs.

The TEP pulse is also an example of an electric current that involves net translational motion of aether without any net translational motion of charged particles. See section **II** of ‘Equilibrium in the Electric Circuit’ at,

<http://www.wbabin.net/science/tombe32.pdf>

## References

[1] The **G2** force may have played a role in the reversals of the Earth’s magnetic field if such reversals ever did occur. This would assume that the Earth’s magnetic field is caused by the rotation of the Earth and later embedded ferromagnetically into the iron core. If for whatever reason the

Earth had ever experienced a cataclysmic event such as being struck by a large celestial object, this would have altered the Earth's axis of symmetry. A **G2** force would then have been induced and the Earth would have experienced a torque that may have re-aligned it in relation to its space-fixed axis of rotation. This in turn would have put the ferromagnetic alignment out of synchronization with the rotation axis and a new ferromagnetic alignment would have commenced.

[2] The rolling friction does not and cannot cause the reversal torque. It is nevertheless necessary during a transitional stage of the cycle. It enables the rattleback to perform a rolling rocking motion. Without rolling friction, this intermediate stage cannot be achieved.

[3] The electric sea is a solenoidally aligned solid of rotating electron-positron dipoles that permeates throughout all space and acts as the luminiferous medium. Electromagnetic waves are propagations of angular acceleration through the rotating electron-positron dipoles and they have a finite speed which can be measured and calculated from theory. Electromagnetic waves should not be confused with either TEP waves or with aether compression waves.