the general science journal

Archimedes' Principle in the Electric Sea

(A Theory of Microscopic Centrifugal Force)

Frederick David Tombe,
Belfast, Northern Ireland, United Kingdom,
Formerly a Physics Teacher at
College of Technology Belfast, and
Royal Belfast Academical Institution
sirius184@hotmail.com
22nd October 2006, Sarawak
(14th June 2007 amendment, Belfast)

Abstract. It is commonly accepted that hydrostatic pressure in a liquid is exclusively linked to the irrotational potential energy which is connected with the Coulomb force that acts between the molecules in the liquid.

Maxwell however demonstrated that hydrostatic pressure in his proposed sea of molecular vortices also contains a centrifugal component that is due to fine grain rotational kinetic energy. This centrifugal pressure arises due to the mutual tangential motion of the electrical particles of his molecular vortices.

Maxwell went on to demonstrate that a centrifugal pressure gradient in his vortex sea accounts for the force that acts on unmagnetized materials when they are placed in a magnetic field. It is now proposed that this forgotten aspect of electromagnetism lies at the root of the 1922 Stern-Gerlach experiment in which a fundamental duality was exposed in silver atoms.

The Hydrodynamical Theory of Magnetism

I. In part I of his 1861 paper 'On Physical Lines of Force' [1],

http://vacuum-physics.com/Maxwell/maxwell_oplf.pdf

James Clerk-Maxwell modelled the magnetic field hydrodynamically. Just like Bernoulli, he assumed the existence of a sea of tiny vortices pressing against each other due to centrifugal expansion pressure. In his hydrodynamical analysis, Maxwell considered the contribution of centrifugal force towards the total hydrostatic pressure in his sea of molecular vortices, and the concluding equation (5) in part I of his 1861 paper was similar in principle to equation **(1)** below,

$$-d\mathbf{A}/dt = -\text{grad}\psi - \text{grad}\,(\mathbf{A}.\mathbf{v}) + \mathbf{v}\times\mathbf{B} - \partial\mathbf{A}/\partial t_{\text{(rotational)}} \qquad \textbf{(1)}$$

Equation **(1)** can be derived from equation (58) in Maxwell's 1861 paper simply by expanding the left hand side into local and convective terms, and substituting the electrostatic term $-\text{grad}\psi$ in place of the irrotational component of $\partial\mathbf{A}/\partial t$. This was demonstrated in section **III** of 'Gravitational Induction and the Gyroscopic Force' at,

http://www.wbabin.net/science/tombe5.pdf

where **A** represents aether field velocity and where **B** satisfies the vorticity equation curl **A** = **B**. It follows therefore that electric charge is a quantity associated with irrotational radial aether flow, whereas spin, curl, and magnetism are connected with tangential aether flow. Negative charge is an aether sink while positive charge is an aether source. Charge and spin share a mutually orthogonal relationship to each other.

The **A**.**v** term on the right hand side of equation **(1)** clearly corresponds to the second term on the right hand side of Maxwell's equation (5), and it must be closely connected with both kinetic energy and centrifugal force, since both of these quantities involve the square of velocity.

It is centrifugal force that we are interested in and we will now take a closer look at Maxwell's treatment of centrifugal force in relation to the magnetic force acting on unmagnetized materials.

Microscopic Centrifugal Pressure

II. The second term on the right hand side of Maxwell's equation (5) contains the square of the circumferential velocity of his vortices. It clearly represents a force that exists in the presence of a centrifugal pressure gradient.

Maxwell related this term to the situation in which unmagnetized materials are immersed in his sea of molecular vortices. The magnetic field lines will permeate through the unmagnetized material to a greater or a lesser degree. The magnetic field strength is essentially the vorticity of the molecular vortices and so if the magnetic field should happen to be inhomogeneous, this will result in a centrifugal pressure gradient, and hence a magnetic force.

The Magnetic Archimedes' Principle

III. This magnetic force will move the immersed material either away from the region of greater magnetic intensity or towards the region of greater magnetic intensity depending on the material's magnetic permeability. Magnetic permeability in Maxwell's 1861 paper refers to the density of the sea of molecular vortices.

It has been suggested in 'The Double Helix Theory of the Magnetic Field',

http://www.wbabin.net/science/tombe.pdf

that Maxwell's molecular vortices are more accurately represented by rotating electron positron dipoles such that the vortex sea is in effect an electric sea of pairs of mutually orbiting electrons and positrons bonded together in a double helix fashion and such that the axes of these rotating dipoles represent fine grain angular momentum and trace out solenoidal magnetic lines of force. The magnetic permeability of the immersed material will therefore refer to the density of the electron positron cloud surrounding the atomic or molecular nuclei. If the magnetic

permeability inside the immersed material is greater than that of the electric sea outside it, then we will have a paramagnetic situation and the magnetic lines of force will be more concentrated inside the immersed material than outside it. In the paramagnetic scenario, the body will move towards the region of greater magnetic intensity. If the magnetic permeability inside the immersed material is less than the permeability of the electric sea outside it, we will have a diamagnetic situation and the magnetic lines of force will be rarefied inside the immersed material as compared to outside it. In the diamagnetic situation, the body will move away from the region of greater magnetic intensity. This is simply Archimedes' Principle in the electric sea.

The 1922 Stern-Gerlach Experiment

IV. The 1922 Stern-Gerlach experiment exhibits a fundamental duality in silver atoms. Silver atoms are passed through an inhomogeneous magnetic field. Despite the fact that silver is normally only a weak diamagnetic material, fifty percent of these atoms are deflected one way along the lines of magnetic force, and the other fifty percent are deflected by exactly the same amount, but in the exact opposite direction. It is already accepted that this duality cannot be primarily caused by electric charge because the Coriolis force $\mathbf{F} = q\mathbf{v}\mathrm{X}\mathbf{B}$ that acts on a charged particle moving in a magnetic field acts in the equatorial plane of the magnetic field lines, and as such could not cause it to deflect into the axial direction of these field lines.

The generally accepted theory is that the deflection is caused by magnetic spin moment and that silver atoms exhibit a duality in respect of their magnetic spin moment. This argument must also be dismissed. When a magnetic dipole is placed in a magnetic field, the first result is that it swivels into line. If there was a duality of magnetic dipole moment in silver atoms, this would disappear once all the atoms had been aligned by the magnetic field.

The only conclusion can be that the duality in the silver atoms is based on a paramagnetic/diamagnetic division. This in turn could only come about if there is a duality in silver atoms as regards their magnetic permeability. If fifty percent of silver atoms possessed positive nuclei, then we would expect that the surrounding positrons of the electron positron dipoles should be repelled away from the nuclei, and that the electrons should be attracted towards the nuclei. This would result in a rarefaction of the electron positron dipole cloud, and hence a diamagnetic silver atom. On the other hand, if the nucleus of the silver atom happened to be negatively charged, then we would expect that both the electrons and the positrons should be attracted to it, since sinks are mutually attractive. This would lead to a considerably more dense electron positron dipole cloud, and hence a paramagnetic silver atom.

References

[1] Clerk-Maxwell, J., "On Physical Lines of Force", Philosophical Magazine, Volume 21, (1861)

[2] 'Electric Centrifugal Force', Prof. AKT Assis, Brazil
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