Bernoulli's Principle and the Theory of Flight

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***Abstract*. When a body moves through an elastic medium so as to cause a differential transverse stress on either side of the body, a force will be induced at right angles to the direction of motion. This induced force which is observed to be acting on the planets in orbit, on electric currents in a magnetic field, and on aeroplanes in flight, can be traced to centrifugal force acting between the vortices of the elastic medium.**

Centrifugal Force

I. The classical planetary orbital equation indicates that centrifugal force is a radial inverse cube law repulsive force which is a function of transverse motion. It follows therefore that centrifugal force in this respect must be an electromagnetic effect arising in a sea of electric dipoles. This conclusion follows from the fact that electric dipoles are associated with an inverse cube law force field. It means that what is in fact a significant physical force is being masked out of view in terrestrial situations under the guise of Euclidean geometry.

Maxwell proposed that space is filled with a solenoidally aligned sea of molecular vortices. He demonstrated that it is differential centrifugal pressure in this sea of molecular vortices which causes the force that acts on a current carrying wire. This is explained on page 172 in part I of his 1861 paper 'On Physical Lines of Force'.[1] As such we can conclude that space is densely packed with rotating electron-positron dipoles in which the electrons act as aether sources, and the positrons act as aether sinks. These dipoles will be solenoidally aligned in a double helix fashion such that the alternate stacking of the electrons and the positrons gives rise to magnetic lines of force and the associated tension along those lines.[2] The Coriolis force which occurs due to the centrifugal barrier in the transverse direction in a planetary orbit exhibits the relationship $\mathbf{H} = 2\boldsymbol{\omega}$ where $\mathbf{H}$ is vorticity and $\boldsymbol{\omega}$ is angular speed. This means that the electron-positron sea must be a rigid solid. This solid will be permeated with an

aether juice which oils the interface regions as material bodies move through it. The gravitational field of all bodies will entrain an extended region of the electron-positron sea along with them when they are undergoing translational motion. An effusion of aether pressure from the positrons will oil the shear regions at the interfaces in line with Kepler's laws of planetary motion.

As regards aerodynamic lift, the source of the centrifugal force will be on a larger scale. Air pressure is a product of the repulsive force that exists between air molecules due to their vorticity, and that repulsive force will be the centrifugal force which arises due to the mutual circumferential speed between neighbouring vortex air molecules.

Bernoulli's Principle

II. Pressure is dimensionally equivalent to energy per unit volume. If we increase the volume of a sample of gas, the pressure will reduce. When an aeroplane is moving forwards, the camber on the upper side of the wings will cause the air above the wings to expand. This expansion of the air above the wings will result in a differential centrifugal pressure above and below the wings which will cause the aeroplane to rise. An additional lift factor is the deflection of the air downwards by the underside of the wings due to the angle of attack. This will result in an upward reaction force on the wings. This latter effect, which is more accurately the Coriolis force, is the perpendicular deflection which occurs on encountering a centrifugal barrier. In this case, the centrifugal barrier exists in the vortex air molecules.

Bernoulli's principle is essentially a statement of the principle of conservation of energy. When the pressure or potential energy decreases, the kinetic energy will increase proportionately provided that only irrotational forces are involved. Centrifugal force is an irrotational force $\nabla(\mathbf{A}.\mathbf{v})$ where $\mathbf{A}$ is essentially the aether field momentum, and $\mathbf{A}.\mathbf{v}$ is the centrifugal potential energy. See **Appendix A**. If we ignore frictional, absorption, and resistive losses, the Coriolis force in aerodynamics does not involve any exchange between kinetic energy and potential energy and so it is not involved in Bernoulli's principle.

Bernoulli's principle is involved in the theory of flight because in the rarefied region of air above the wings, some centrifugal potential energy will have converted into kinetic energy resulting in a faster flow of air

above the wings. This faster flow of air above the wings, in line with Bernoulli's principle, is not however the cause of the reduction of the air pressure, but rather a consequence of it. Bernoulli's principle is not therefore the actual root cause behind the theory of flight.

Conclusion

III. The principle of flight is centrifugal force, both in its pure form and also in the form of its Coriolis off-shoot. Centrifugal force is induced at right angles to the forward motion of the aeroplane due to these two closely related mechanisms. Pure centrifugal force involves Bernoulli's principle. The camber on the upper side of the wings causes a rarefaction and hence an energy exchange from potential energy to kinetic energy which in turn causes a lesser centrifugal pressure in the air molecules above the wings as compared to below. The aerodynamical Coriolis mechanism on the other hand does not involve any exchange between kinetic energy and potential energy. The angle of attack causes a collision between the underside of the wings and the horizontal centrifugal barrier in the air molecules. This causes a reactive Coriolis force which pushes the aeroplane vertically upwards.

Appendix A

The gradient of the scalar product of two vectors can be expanded by the standard vector identity,

$$\nabla(\mathbf{A}.\mathbf{v}) = \mathbf{A}\times(\nabla\times\mathbf{v}) + \mathbf{v}\times(\nabla\times\mathbf{A}) + (\mathbf{A}.\nabla)\mathbf{v} + (\mathbf{v}.\nabla)\mathbf{A} \qquad \textbf{(1A)}$$

Let us consider only the vector **A** to be a vector field, and let us consider it to represent aether momentum. If **v** represents arbitrary particle motion, the first and the third terms on the right hand side of equation **(1A)** will vanish, and from the relationship $\nabla\times\mathbf{A} = \mathbf{B}$, we will obtain,

$$\nabla(\mathbf{A}.\mathbf{v}) = \mathbf{v}\times\mathbf{B} + (\mathbf{v}.\nabla)\mathbf{A} \qquad \textbf{(2A)}$$

Hence,

$$(\mathbf{v}.\nabla)\mathbf{A} = -\mathbf{v}\times\mathbf{B} + \nabla(\mathbf{A}.\mathbf{v}) \qquad \textbf{(3A)}$$

Since,

$$d\mathbf{A}/dt = \partial\mathbf{A}/\partial t + (\mathbf{v}.\nabla)\mathbf{A} \qquad \textbf{(4A)}$$

so long as we keep the density constant, it follows that,

$$d\mathbf{A}/dt = \partial\mathbf{A}/\partial t - \mathbf{v}\times\mathbf{B} + \nabla(\mathbf{A}.\mathbf{v}) \qquad \textbf{(5A)}$$

This force is a generalized version of the so-called Lorentz force which appeared at equation (77) in Maxwell's 1861 paper. The extra term, $\nabla(\mathbf{A}.\mathbf{v})$, is the centrifugal force which appeared at equation (5) in the same paper. The first term on the right hand side of equation **(5A)** can be split into a radial and a transverse component. The radial component is the irrotational force which can be written as $\nabla\Psi$, where Ψ is the scalar potential function. The second term on the right hand side is the Coriolis force.

References

[1] Clerk-Maxwell, J., "On Physical Lines of Force", Philosophical Magazine, Volume 21 (1861)
http://vacuum-physics.com/Maxwell/maxwell_oplf.pdf

[2] Tombe, F.D., "The Double Helix Theory of the Magnetic Field"
http://www.wbabin.net/science/tombe.pdf

and also "Archimedes' Principle in the Electric Sea", Galilean Electrodynamics, Volume 20, Number 1, page 19 (2009)