

The Two Kinds of Electric Charge

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Abstract. In an earlier article, it was explained how there are four kinds of electric charge. There are in fact only two kinds of electric charge. The earlier article created four kinds of charge by identifying both a simple and a compound version for each of positive and negative charge. Simple charge was based on the tension and pressure associated with pure aether flow, in and out of negative and positive particles, while compound charge was about the intermediary effect of the electron-positron dipoles that fill the space between charged bodies. A charged body linearly polarizes the surrounding electron-positron sea and this causes a centrifugal repulsive force to act laterally from the field lines. It will be explained how two negative charges may either attract or repel depending on the strength of the charge, and hence explaining the link between gravity and electrostatics.

Introduction

I. In his 1861 paper “*On Physical Lines of Force*” [1], James Clerk-Maxwell did not use familiar concepts such as mass and charge. Instead he used what are nowadays unfamiliar concepts such as tiny aethereal vortices that are pressing against each other with centrifugal force while striving to dilate. Since the existence of both aether and centrifugal force are denied in modern physics, and since Maxwell used old fashioned mathematical notation and split his equations into the three Cartesian components, this makes it difficult for readers to relate his work to modern electromagnetism. People reading Maxwell’s 1861 paper tend to ask “what are the vortices in?”, and when they see mention of centrifugal force, they are reminded that they have been taught that centrifugal force does not exist.

In actual fact however, Maxwell’s approach is rather straightforward. He uses standard hydrodynamics as applied to a sea of tiny vortices and we see what looks very like Dan Bernoulli’s famous principle amongst his equations. The familiar quantities mass and charge are subsumed into the term ‘*per unit volume*’. If we consider mass to be simply the amount of aether and charge to be related to the aether density, then mass to charge ratio will become simply ‘*per unit volume*’. This makes perfect sense if positive charge is compressed aether and negative charge is stretched aether. We then have two kinds of charge, pressure and tension, with positive particles being sources in the aether and

negative particles being sinks in the aether. Even if we don't know what the aether is or what powers the sinks and sources, the important thing is that we realize that it exists and that the sea of vortices can explain the geometrical form of the electromagnetic and the inertial forces. This is of particular importance when we consider the convective force of the general form $\mathbf{v} \times \mathbf{H}$, with \mathbf{v} being velocity and \mathbf{H} being vorticity. Maxwell explains this as being a result of differential centrifugal pressure from the tiny vortices, pressing unevenly on an object or an element of electric current. There can be no other possible explanation for a force which only acts when motion occurs, and which acts at right angles to the motion. The $\mathbf{v} \times \mathbf{H}$ form is the basis of the convective term in the modern day Lorentz force (which was actually equation (77) in Maxwell's 1861 paper), and it is also the basis of both the simple centrifugal force and the Coriolis force in planetary orbits, albeit that the latter are wrongly considered in modern physics to be merely fictitious.

Maxwell explains time varying electromagnetic induction on the basis that when an electric current is increasing, the tiny molecular vortices at the side of the wire are caused to angularly accelerate. Maxwell described this tendency mathematically using the rotational inertia equation $\text{curl } \mathbf{A} = \mu \mathbf{H}$, where \mathbf{A} takes on the role of a tangential impulse on a fly-wheel. The vector \mathbf{A} is essentially just the electric current, which is necessarily unidirectional in order to bring about this effect. This can be reconciled with the bi-directional Fechner hypothesis of 1845 if we consider that positive particles are pushed along with the aether flow, whereas negative particles eat their way in the opposite direction towards the power source. In other words, the particle motion in electric current is only an effect that is caused by a more fundamental unidirectional flow of aether, and the charge on a current carrying wire is due to the pressure or tension in the aether. Hence the charge on a wire will enter the circuit from the external power source. One of Maxwell's mistakes seems to have been in failing to realize that the electric particles that he placed around his aethereal vortices should really have been merely a single electron and a single positron, and that hence his sea of molecular vortices was in fact a dielectric sea of electrons and positrons which we will refer to in this article as '*The Electric Sea*'. [2]

In 1856, Weber and Kohlrausch linked optical phenomena to electromagnetism. They discharged a Leyden jar and linked the speed of light to the electrostatic/electrodynamic ratio. In 1861, Maxwell showed how this ratio can be inserted into Newton's equation for the speed of a wave in an elastic solid, and hence he showed that light is an electromagnetic wave. Modern textbooks unfortunately approach this issue with the benefit of hindsight while eliminating the rationale behind it by eliminating the sea of aethereal vortices along with its associated density and transverse elasticity. And to make matters worse, modern textbooks tend to focus on the mathematical solutions to Maxwell's equations rather than on the physical meaning behind them.

Gravity

II. There is no physical explanation for gravity that does not invite more questions. The idea that gravity is caused by the perfectly irrotational inflow of aether immediately invites an inquiry into the physical nature of the aether. In an article written by Nikola Tesla in 1930 entitled “*Man’s Greatest Achievement*” [3], Tesla writes,

“Long ago he (mankind) recognized that all perceptible matter comes from a primary substance, of a tenuity beyond conception and filling all space - the Akasha or luminiferous ether - which is 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”. (Tesla, 1930)

Sir Oliver Lodge wrote the article on “*Ether (in physics)*” for the 1937 Encyclopaedia Britannica (fourteenth edition). [4] The article states,

“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” (Sir Oliver Lodge, 1937)

and then goes on to cite Lord Kelvin, “*The Vortex Theory of Ether,*” *Phil. Mag.* (1887) and *Math. and Phys. Papers*, vol. iv. and passim; also G. F. FitzGerald, *Proc. Roy. Dub. Soc.* (1899), or *Collected Papers*, pp. 154, 238, 472.

According to E.T. Whittaker [5],

“All space, according to the younger 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. It will be seen that Bernoulli is a thorough Cartesian in spirit; not only does he reject action at a distance, but he insists that even the elasticity of his aether shall be explicable in terms

of matter and motion. This aggregate of small vortices, or " fine-grained turbulent motion," as it came to be called a century and a half later, is interspersed with solid corpuscles, whose dimensions are small compared with their distances apart. These are pushed about by the whirlpools whenever the aether is disturbed, but never travel far from their original positions. A source of light communicates to its surroundings a disturbance which condenses the nearest whirlpools; these by their condensation displace the contiguous corpuscles from their equilibrium position; and these in turn produce condensations in the whirlpools next beyond them, so that vibrations are propagated in every direction from the luminous point. It is curious that Bernoulli speaks of these vibrations as longitudinal, and actually contrasts them with those of a stretched cord, which, "when it is slightly displaced from its rectilinear form, and then let go, performs transverse vibrations in a direction at right angles to the direction of the cord." When it is remembered that the objection to longitudinal vibrations, on the score of polarization, had already been clearly stated by Newton, and that Bernoulli's aether closely resembles that which Maxwell invented in 1861-2 for the express purpose of securing transversality of vibration, one feels that perhaps no man ever so narrowly missed a great discovery. Bernoulli explained refraction by combining these ideas with those of his father. Within the pores of ponderable bodies the whirlpools are compressed, so the centrifugal force must vary in intensity from one medium to another. Thus a corpuscle situated in the interface between two media is acted on by a greater elastic force from one medium than from the other; and by applying the triangle of forces to find the- conditions of its equilibrium, the law of Snell and Descartes may be obtained. * Cf. Lord Kelvin's vortex-sponge aether, described later in this work."*

If we can explain electromagnetism and inertia in terms of such a sea of tiny aether vortices, pressing against each other with centrifugal force while striving to dilate, as the younger John Bernoulli [5] and James Clerk-Maxwell [1] have done, and without any knowledge of the physical nature of the aether itself, then we can use the same aether of which these tiny vortices are comprised, in order to shed some light on the mechanism behind gravity. Hence, without knowing the physical nature of the aether itself, we can still nevertheless surmise that gravity is a large scale inflow of aether through the sea of tiny aether vortices, and that the tiny vortices will absorb large scale vorticity, and that this will seriously undermine the vorticity in the gravitational acceleration field and maybe also in the gravitational velocity field. We can also reason that when large scale aether flow passes through these tiny vortices, it will cause them to become linearly polarized. Linear polarization of a rotating dipole will however result in a precession. When these tiny dipoles then precess due to being caught up in large scale aether flow, this will induce an increased centrifugal pressure,

lateral to the flow, which if strong enough will be capable of reversing an attractive force into a repulsive force, hence showing us that electrostatic repulsion between negative charges is in fact a compound effect of strong gravity. We can't know what is driving the large scale gravitational aether flow, but by understanding the significance of the sea of tiny aether vortices, we can at least comprehend the fact that gravity involves the same kind of fluid-like aether as is involved in electromagnetism and centrifugal force. We can further appreciate that if electromagnetic radiation involves a net flow of aether, then gravity, being a flow of the same aether, will have an effect on optical phenomena. Gravity involves large scale aether flow through the sea of tiny aether vortices, whereas magnetic repulsion and electromagnetic radiation involve the fine-grained centrifugal pressure emanating from the tiny vortices. Magnetic attraction on the other hand involves the fine-grained bi-directional flow of aether between neighbouring vortices as will be clarified in section **III** below.

The Double Helix

III. The important thing about the tiny aether vortices that fill all of space is the fact that they are dipolar. They each have a sink (an electron) and a source (a positron). This creates a situation in which space is densely packed with electrons and positrons in a state of rapid motion. It is not however Brownian motion, but rather a very ordered motion in which rotating electron-positron dipoles are bonded together in an elastic solid. These tiny vortices self organize with respect to their neighbours along their mutual rotation axes so as to form double helix toroids. [2] This has the effect of channelling an electrostatic force along distinct lines in an electrically neutral backdrop. These lines of force cause magnetic attraction. The double helix toroids are therefore the solenoidal magnetic lines of force that we see around bar magnets and electric circuits and which collectively form another toroid on a larger scale. More generally these solenoidal lines of force meet at an axis of rotation or circle around an axis of cylindrical symmetry.

Meanwhile, the centrifugal force in the equatorial plane of the dipoles causes a lateral pressure to emanate from these magnetic lines of force. This lateral centrifugal pressure is the cause of magnetic repulsion, and in conjunction with the tension along the lines, a stable equilibrium is achieved. The individual dipoles will be firmly bonded into place by the negative to positive attraction along the axis combined with gyroscopic stability.

The Reversal Threshold

IV. Negatively charged bodies will cause a unidirectional inflow of aether through the surrounding electron-positron sea. This results in the superimposition of a radial effect on top of an already existing solenoidal alignment. The tendency of the unidirectional aether flow will be to linearly polarize the electron-positron dipoles. However, since these dipoles are already in a state of rotation, the linear polarization will cause a torque which will result in a precession of the dipoles. This precession will generate aether pressure from the positrons that will both impede the inflow and also exert pressure laterally from the radial lines of force that are associated with the inflow. If the negative charge is large enough, two negatively charged bodies will repel each other because the centrifugal pressure acting sideways from the field lines will be greater than the gravitational tension which acts along the field lines. On this basis, gravity is simply weak negative electric charge, and hence objects which are traditionally considered to be neutral, are not in fact neutral. The radial inflow associated with negative charge (including gravity) is in effect simply a negative electric current.

Just like in the case of solenoidal magnetic stability, there is a tension acting along the lines of force and a centrifugal pressure acting laterally from them, but the details are different.

Magnetic Lines of Force and Electric Current

V. A magnetic line of force is a bi-directional spiral flow of aether, with the rotating electron-positron dipoles fixed in space and retaining their relative positions with respect to each other. The aether will flow out of the positrons and into the electrons of the neighbouring dipoles along the axial direction, and this necessarily means that aether will be flowing in two directions. This situation is somewhat reversed in the case of a steady state electric current in a conducting material. As was explained already in section **I**, an electric current is a unidirectional flow of aether which pushes positive particles along with it, whereas negative particles eat their way towards the source while spiralling against the positive particles in the opposite direction.

Neutral Objects in Force Fields

VI. Coulomb's law of electrostatics apparently fails to deal with the situation in which a neutral body is attracted to a charged body. This situation is resolved if we consider gravity to be negative electric charge, and that hence there are no neutral bodies. This might explain the electrostatic force that acts on so-called neutral objects. However, terrestrial objects cannot shield other terrestrial objects from the Earth's gravity, and so we must conclude that the aether flows right through all terrestrial objects. We cannot therefore explain the electrostatic force acting on so-called neutral terrestrial objects on the basis that they are negatively charged. In order to explain it, we resort to the fact that the applied electrostatic field induces linear polarization within the object, and in the case of conducting materials, this linear polarization is on the large scale with the negative charges flowing to one end and the positive charges to the other end. Electric current is a one way flow of pressurized aether, but as Fechner hypothesized in 1845, in a conducting material, it involves a two way flow of particles. Positrons, being sources, will be pushed along with the flow, whereas electrons, being sinks, will eat their way towards the power source. In laboratory electrostatic experiments, the electrostatic force only acts on the surplus fermions and not on the body as a whole. Since gravity acts on the whole body and flows right through terrestrial objects, electrostatic forces can only overpower gravity in this manner when the main body is light.

A magnet will attract an unmagnetized paramagnetic body by virtue of the fact that the magnetic lines of tension will be concentrated through the paramagnetic material. In the case of a diamagnetic material, the magnetic field lines will tend to concentrate around the outside of the body, hence pushing it away with the centrifugal force that acts laterally from the field lines. This is Archimedes' Principle operating in the electric sea.

Conclusion

VII. Gravity is mutually attractive, whereas electrostatics is mutually repulsive. The two theories however blend together into a single hydrodynamical theory when we understand the reversal threshold mechanism. Space is densely packed with a sea of tiny dipolar aethereal vortices (electron-positron dipoles) which is the cause of electromagnetic phenomena. Gravity and electrostatics on the other hand involve the large scale flow of aether through this electron-positron sea. The gravitational field and the negative electrostatic field are monopole fields, and hence we should expect the inverse square law to apply. However, there will also be a centrifugal pressure acting laterally from the field lines due to the tiny dipoles which will be in a state of stress due to the large scale aether flow

in which they are immersed. If the large scale inflow is strong enough, this lateral pressure will over ride the attractive force and we will have electrostatic repulsion as between two negative charges, and it will obey the inverse cube law of the dipole field. Gravity is simply mild negative electric charge, while Coulomb's law is not applicable to electrostatic repulsion which in fact involves an inverse cube law.

When a positive charge is attracted to a negative charge, the field lines join directly between the two charges while the aether flows from one charge to the other. In the case of gravitational attraction, the field lines between the two gravitating bodies spread outwards and come together laterally, while the aether flows into each of the two bodies from beyond. Hence the parallel that is sometimes seen as between Coulomb's law of electrostatics on the one hand, and Newton's law of gravity on the other hand is not as pure as one might think.

It is commonly believed that the inertial mass of a body does not affect its acceleration in a gravitational field, as purportedly demonstrated by Galileo at the Leaning Tower of Pisa, whereas it affects its acceleration in an electrostatic field. Inertial mass does in fact affect acceleration in a gravitational field exactly as it does in an electrostatic field. The reason why we sometimes think otherwise is because we are observing small objects under the influence of a large object (The Earth), and we are making the observation from the frame of reference of the large object. In general, the acceleration due to gravity, relative to the centre of mass of two objects, will depend on the inertial mass, as is the case with every other kind of force. Gravity is simply weak negative electric charge.

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