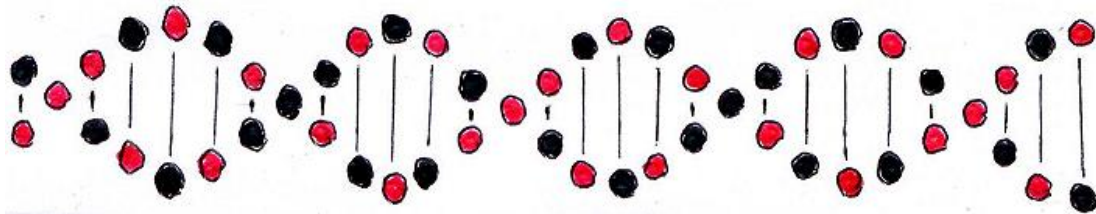


The Absolute Direction of Alternating Current

*Frederick David Tombe,
Belfast, Northern Ireland,
United Kingdom,
sirius184@hotmail.com
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The Mystery

I. Electric energy that is generated at a power station flows in one direction only, away from the station and to the consumer, yet the electric current itself alternates to-and-fro. How can this be possible? We will seek to solve this mystery.

The Closed Circulation Explanation

II. Consider an AC power line in which the energy is flowing from east to west. During one half of the AC cycle, an observer at a fixed point under the power line will see the current flowing in a westerly direction. At the end of this half-cycle, the current will then be observed to reverse its direction, and it will begin flowing eastwards in the likeness of a backwash, back towards the power station again. However, while we can imagine the power station pumping the electricity outwards at close range, it's much more difficult to imagine the electricity being sucked back in again from a distance. It would be a bit like a bow trying to bring an arrow back again from a mile away.

It would be a different matter though if the observer wasn't actually seeing the same electricity reversing back again, but rather observing new electricity entering the wire from the space beyond it, with the entry point moving west in the same direction as the energy flow. This new electricity would of course have to be part of the circulation of the next half-cycle coming behind, flowing across from the other wire, which would mean that the electric current has to cross the dielectric gap between the two wires, and of course, the closer the wires are together, the lesser will be the impedance. In the case of a three-phase generator, the same principles will still hold.

In the next section we'll take a closer look at the deeper physical nature of electric current and how it might cross a dielectric gap, but the broader picture emerging is that alternating electric current is emitted from the generator in expanding circulations, and that each circulation flows in the opposite direction to the one in front of it and behind it. The propagation speed and the circulation speed will both be in the order of the speed of light. See **Appendix I**.

The Electric Fluid

III. We know from electrolysis that when an electric current is flowing, positive ions move in one direction while negative ions move in the other. However, for the purpose of transferring energy and generating the surrounding magnetic field, there really needs to be an absolute physical direction for electric current, dictated by a more fundamental undercurrent.

It is proposed that there exists a fundamental electric fluid which pervades all the universe and from which everything is made. This fluid is the aether, and in the eighteenth century, the younger John Bernoulli suggested that throughout all space, it is rendered into tiny vortices that press against each other with centrifugal force while striving to dilate, hence accounting for some optical phenomena, [1]. In the next century, in the year 1861, in his paper "*On Physical Lines of Force*", James Clerk Maxwell showed that this sea of aether vortices serves as the medium responsible for both optical and electromagnetic phenomena, [2], and meanwhile, based on observing a rattleback reversing its direction of rotation, it is almost certainly also the medium responsible for inertial phenomena, [3]. Nikola Tesla gives further insight into the nature of the aether in a 1907 article entitled, "*Man's Greatest Achievement*", [4].

It is further proposed that negatively charged particles constitute sinks in the aether while positively charged particles constitute sources, and that electric current is a flow of pure aether which imparts its acceleration to charged particles so that it will push positively charged particles in the same direction while negatively charged particles eat their way in the opposite direction towards the aether source. While the typical speed of aether flow from source to sink is in the order of the speed of light, the charged particles that get involved with electric current are never accelerated to speeds anywhere near this. Electrical resistance in conducting wires ensures that the drift velocities of charged particles are nowhere near the speed of light, but it's important to understand that these charged particles are not the primary essence of electric current.

The AC Generator

IV. For simplicity we'll stick with the single-phase generator. During one half-cycle, pressurized electric fluid is generated electromagnetically from the background sea of tiny aethereal vortices and it is pushed out through one of the two terminal wires. According to the "*The Double Helix Theory of the Magnetic Field*", [5], [6], [7], this vortex sea is a dielectric, because the tiny vortices each comprise of an electron orbiting a positron. The aether (electric fluid) emerging from one terminal of the generator crosses the dielectric gap forming a closed electric circulation with the aether that gets pulled in at the other terminal. As the aether crosses the dielectric gap, it induces dielectric polarization in the vortex sea and this impedes the flow, but since the circulation is expanding under pressure, the aether fluid simply sweeps out wide of this impedance as it progresses outwards from the generator, and the state of polarization propagates with it in the space alongside the conducting wire.

Conclusion

V. Each half-cycle of an alternating current involves a propagating closed circulation of the fundamental electric fluid, and after each half-cycle, the direction of the next circulation reverses, while the direction of linear propagation remains unchanged. These closed circulations carry the electrical energy from the power station to the consumer. Hence, while wireless EM radiation, on the one hand, is a fine-grained swirling of electric fluid propagating through the all-pervading sea of tiny aethereal vortices, [8], alternating current, on the other hand, is like a propagation of larger aethereal vortices, guided by conducting wires. The speed of propagation in each case will be determined by the speed of circulation in the vortices, [9], which will be the speed of light in the case of wireless EM radiation, and in the order of the speed of light for electric current.

Only the combination of a linear and a circulatory motion can explain the forward advance of a to-and-fro effect like alternating electric current.

References

[1] Whittaker, E.T., "*A History of the Theories of Aether and Electricity*", Chapter 4, pages 100-102, (1910)

"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 whirlpool."

[2] Maxwell, J.C., **“On Physical Lines of Force”**, Philosophical Magazine, Volume XXI, Fourth Series, London, (1861)
http://vacuum-physics.com/Maxwell/maxwell_oplf.pdf

[3] Tombe, F.D., **“The Rattleback and the Magnus Force”** (2022)
https://www.researchgate.net/publication/361277369_The_Rattleback_and_the_Magnus_Force

[4] O’Neill, John J., **“PRODIGAL GENIUS, Biography of Nikola Tesla”**, Long Island, New York, 15th July 1944, Fourth Part, paragraph 23, quoting Tesla from his 1907 paper **“Man’s Greatest Achievement”** which was published in 1930 in the Milwaukee Sentinel,
“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”.
<http://www.rastko.rs/istorija/tesla/oniell-tesla.html>
<http://www.ascension-research.org/tesla.html>

[5] Tombe, F.D., **“The Double Helix Theory of the Magnetic Field”** (2006)
Galilean Electrodynamics, Volume 24, Number 2, p.34, (March/April 2013)
https://www.researchgate.net/publication/295010637_The_Double_Helix_Theory_of_the_Magnetic_Field

[6] Tombe, F.D., **“The Double Helix and the Electron-Positron Aether”** (2017)
https://www.researchgate.net/publication/319914395_The_Double_Helix_and_the_Electron-Positron_Aether

[7] Tombe, F.D., **“The Positronium Orbit in the Electron-Positron Sea”** (2020)
https://www.researchgate.net/publication/338816847_The_Positronium_Orbit_in_the_Electron-Positron_Sea

[8] Tombe, F.D., **“Wireless Radiation Beyond the Near Magnetic Field”** (2019)
https://www.researchgate.net/publication/335169091_Wireless_Radiation_Beyond_the_Near_Magnetic_Field

[9] Lodge, Sir Oliver, **“Ether (in physics)”**, Encyclopaedia Britannica, Fourteenth Edition, Volume 8, Pages 751-755, (1937)
<http://gsjournal.net/Science-Journals/Historical%20PapersMechanics%20/%20Electrodynamics/Download/4105>
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”*

Appendix I

If the generator at the power station ejects pressurized electric fluid (aether) outwards at a speed in the order of the speed of light, this will be the speed of both the linear propagation and the circulation. As the fluid enters the outbound conducting wire, there will be a split as some of it escapes sideways into the dielectric space beyond the wire. This sideways flow will cross the gap and flow back down again along the return wire towards the generator. In doing so, the dielectric in the gap between the conducting wires will become polarized and this will impede further flow across the gap at this point. The main flow will however continue along the outbound wire, still at a speed in the order of the speed of light, and the polarization process will continue alongside the outbound wire as the current moves away from the generator. In every half-cycle circulation of an alternating current, the magnetic field, the linear polarization, and the circulation direction, will all be reversed in comparison to the circulations immediately in front and behind, but the direction of linear propagation will remain unchanged in all cases.

When the voltage is very high, most of the energy will be transported as hydrostatic aether pressure (electric charge) in the conducting wires, along with the overspill (electrostatic field energy) in the linearly polarized zone between the wires. If this voltage is stepped down at a transformer, then as per Bernoulli's principle, much of the energy will be converted into kinetic energy (electric current) in the wires, along with the overspill in the surrounding magnetic field, and the energy will propagate at a faster speed.