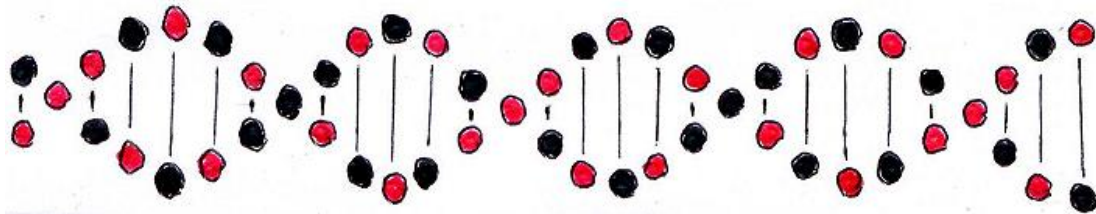


The Absolute Direction of Alternating Current

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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, at both the generator end and at the consumer end, the electric current itself alternates to-and-fro. How can this be possible? We will now take a closer look at the transient state that arises in an electric circuit during the first moments after the power is connected, or after each moment of direction reversal in the case of AC. It's only in the transient state that transmission occurs, whether it be wireless transmission or cable transmission.

The Transient State

II. When the power is first connected to a laboratory electric circuit, it takes a few brief moments before the electric current fully occupies the conducting wires. During this *transient state*, or *convective state*, what begins as a tiny electric circulation at the two terminals, expands outwards between the wires, and part of this circulation crosses the gap between the outward wire and the return wire. It's only in the *saturated state*, as in when the current is fully immersed inside the conducting wires, that energy flows in earnest back to the return terminal.

In the case of a laboratory AC circuit, where the current direction cyclically alternates, the proportion of the time during each cycle when the transient state is significant, will depend on the AC frequency. The higher the frequency, the more significant the transient state will be. In the case of a transmission line however, due to the distance which the current must travel, the saturated state may never be reached, even in the

case of lower frequencies in the 50 or 60 Hz range. When we are dealing with DC, the saturated state is known as the *steady state*.

Consider an overhead cross-country AC power transmission 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 this power line will see the current flowing in a westerly direction. Would we however expect a backwash of the same electricity at the end of this half-cycle? Surely that would undo whatever had just been done. Then there is the further issue that neither does there actually need to be a return wire at all. None of the wires in three-phase cross-country transmission are return wires.

It will now be proposed, that where a parallel return wire is in fact present in a transmission line, that the electric current takes the form of a propagated circulation in the style of a caterpillar track where the backwash along the return wire is either minimal or non-existent. In the case of AC, each half-cycle circulates in the opposite direction to the half-cycles immediately behind and in front of it.

It only then remains to explain how the current crosses the gap between the wires, after which the theory can then be extrapolated to single wire transmission in the form of a solenoidal flow around the current in the wire, similar to the pattern observed in the case of propagation in a coaxial cable.

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.

Electric Current Crossing the Gap

IV. According to the “*The Double Helix Theory of the Magnetic Field*”, [5], [6], [7], space is a dielectric. When the power is first connected to an electric circuit, the electric fluid emerging from the outward terminal crosses the dielectric gap, forming a closed electric circulation back to the return terminal. As this aether crosses the gap, it induces dielectric polarization, and this impedes further flow. But since the circulation is expanding under pressure, the aether fluid simply sweeps wide of this impedance as it progresses outwards from the power source, while the state of polarization in the dielectric propagates with it alongside the conducting wire. This polarization mechanism is the basis of guided transverse electromagnetic waves in a transmission line.

Conclusion

V. Each half-cycle of an alternating current involves a closed circulation of the fundamental electric fluid, and after each half-cycle, the direction reverses. In order, however, for a transmission line to transport AC electric current in a single direction across country, it is proposed that the current that surges outwards along any wire, forms part of a closed circulation that extends into the space beyond the wire in a solenoidal pattern, and that this electric current is not electron flow, but rather a more fundamental aethereal under-current. Each circulating half-cycle disconnects from the power source and advances on its own momentum along the power line. No return wire is necessary, but in a two-wire transmission line, the closed circulation takes the form of a caterpillar track in which the motion is in the outgoing wire.

On the Planck scale, where the propagating aethereal electric circulations constitute wireless radiation through the all-pervading sea of rotating electron-positron vortices, [9], the propagation speed is that well-known speed associated with light. In the case of guided transmission line pulses however, the circulation speed, and hence the propagation speed, while in the same order of magnitude as the speed of light, will likely be somewhat less. See **Appendix I** regarding variation of transmission line speed in connection with Bernoulli's Principle.

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>
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https://www.researchgate.net/publication/295010637_The_Double_Helix_Theory_of_the_Magnetic_Field

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<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)

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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

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. This is capacitance-based transmission. If, however, 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. This is inductance-based transmission.

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