

The aether and its double

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"You hold that time is badly warped,

That even light is bent:

I think I get the idea there,

If this is what you meant:

The mail the postman brings today,

Tomorrow will be sent."¹

This over full, opening quotation marks both the entry of two key characters in our playful, aetheric cast, and the compression of multiple trajectories which this short essay explores. In vertiginous fashion, Dr W. H. Williams adopts one major stylistic trait of author, Lewis Carroll (Charles Dodgson) to parody the latter's own work, Carroll's nonsense poem "The Walrus and the Carpenter". This parody of a parody is placed within the context of a tribute to Sir Arthur Stanley Eddington, on the eve of his departure from UC Berkeley in 1924. The title equally makes evident the relation to Einstein, with Eddington noted historically as a major contributor to the concept of relativity. On the one hand, a historical trajectory is marked, a story of modern science, with address to two key figures, and a set of theories which has very clear roots in the work of James Clerk Maxwell; on the other, a play with time and space is signalled, within a realm precisely of the message, of information.

The trajectory, this path of bent light, can be placed under the sign of the aether; a story of a relationship to substance and the world which can be called science, or language; a question of the becoming of models, and of abstraction. It's a story of the less mysterious, everyday action at a distance, of attraction and repulsion, of lines of force, within phenomena termed as gravity, electricity and magnetism.

"... that these souls of material particles are endowed with knowledge of a truly divine sort, so that they may know without any medium what takes place at very great distances and act accordingly."²

The idea of the aether is transformed from a vague notion which could account for all phenomena, into the medium (the luminiferous aether) and universal reference for the propagation of light (as omnipresent wave, as that which is doing the waving), and finally to pure analogy, to empty space and time, a marker only. The aether falls apart, ironically, as that which is invisible to experimental observation³, and as quite simply unnecessary within theories of

¹ Excerpted from "The Einstein and the Eddington". Dr. W. H. Williams, 1924.

² Descartes to Mersenne, in Correspondence, edited by Adam and Tannery (1893) p. 396.

³ See also the Michelson and Morley aether-drift experiment in the 1880s,

relativity after Einstein. The aether is excised by Occam's razor.

"Aethers were invented for the planets to swim in, to constitute electric atmospheres and magnetic affluvia, to convey sensations from one part of our bodies to another, and so on, until all space had been filled three or four times over with aethers... The only aether which has survived is that which was invented by Huygens to explain the propagation of light."⁴

This transformation of the idea of the aether, and of a parallel transformation of both science and technology as a holding or enframing (as *Ge-stell* after Heidegger), can readily be traced in the literary and experimental work of Huygens, Newton, and Descartes through that of Maxwell, Thomson, Faraday, Michaelson, Morley, Lodge and later to Einstein and Eddington, arriving thus:

"Recapitulating, we may say that according to the general theory of relativity space is endowed with physical qualities; in this sense, therefore, there exists an ether.

According to the general theory of relativity space without ether is unthinkable; for in such space there not only would be no propagation of light, but also no possibility of existence for standards of space and time (measuring-rods and clocks), nor therefore any space-time intervals in the physical sense. But this ether may not be thought of as endowed with the quality characteristic of ponderable media, as consisting of parts which may be tracked through time."⁵

Within this refractive shift of enframing, James Clerk Maxwell occupies a key position in that his work embraces radical shifts in scientific analogy and methodology; a shift from the construction of, albeit largely mental, mechanical models towards "abstract, formal mathematical modelling by differential equations"⁶. In the simple terms of biographer Martin Goldman, "His was a new and utterly disturbing sort of theory, in which he talked of waves, but did not care what was doing the waving."⁷ It was the very kind of theory which thus so disturbed his colleague William Thomson (Lord Kelvin):

"I never satisfy myself until I can make a mechanical model of a thing. If I can make a mechanical model, I understand it... and that is why I cannot get the electromagnetic theory of light."⁸

The means of description is transformed from the particular or corpuscular, through the mechanical, into formal mathematics, information, a software finally which holds (quantum) (un)certainty as that which is, a software which

and the contemporary experimental work of Oliver Lodge, regarding the detection of the earth's motion through the aether.

4 James Clerk Maxwell, "Aether, Encyclopaedia Britannica 9. 1875-1889", *The Scientific Papers of James Clerk Maxwell*, New York, 1960, 763-775.

5 Albert Einstein, "Lecture at Leyden University, 1920", *Sidelights on Relativity*, Dover, New York, 1952, 15,16,23.

6 Martin Goldman, *Demon in the Aether. The Life of James Clerk Maxwell*, Paul Harris Publishing, Edinburgh, 1983, 196.

7 *ibid.* 196.

8 William Thomson Kelvin, *Notes of Lectures on Molecular Dynamics and the Wave Theory of Light*, Baltimore, 1884, 270.

IS the aether, as allowing for both marking and measurement. And this story is readable not just in science (fiction) but equally in the twinned landscape of technological and military activity; a coming into history of a laboratory planet.⁹

For after all:

"... the aether is little more than a nominative case of the verb to undulate..."¹⁰

Under such untied analogy, science becomes a question of purely functional abstraction, little caring for answering the childish wonderland question of what exactly is doing the waving. And yet to think otherwise, is there not some kind of confusion between the map and its famous territory, concerning these predictive models (of science) which do not profess to do anything other than maintain the parody of the opening quotation, existing solely within a land of card figures "which have no thickness."¹¹ The history of the aether as a literary phenomena, as a thinking about the world is thus exactly the journey from the underground to the looking glass, to the incorporeal double (of Alice); a closed circuit of mirroring scientific construction and constructivism, describing the world and making the world as it is and will be:

"In an ordinary belfry, each bell has one rope which comes down through a hole in the floor to the bellringer's room. But suppose that each rope, instead of acting on one bell, contributes to the motion of many pieces of machinery, and that the motion of each piece is determined not by the motion of one rope alone, but by that of several, and suppose, further that all this machinery is silent and utterly unknown to the men at the ropes, who can only see as far as the holes in the floor above them."¹²

Reversal

The mail arrives before it will be sent (in the future); the later Eddington-inspired parody is an example of workaday scientific humour concerned exactly with the violation of spatiotemporal locality which Maxwell, under the sign of the aether and in the context of the unification of electricity, magnetism and light, and later Einstein, grappled with. A clear line leads us into the spectral side of quantum mechanics, the "spooky action at a distance" of quantum entanglement, a future science of uncertainty. By way of a quite specific regard to "making sense," William's fragment of a longer non-sense poem shadows contemporary science and mocks a future science, that message which has yet to be sent, but which has already arrived. The door is opened to all sorts of ghost writers, riding this electromagnetic (EM) storm, a later TEMPEST, debating a planetary, aetheric drift¹³. Precisely what is at stake in this play of time and space, this refractive index bending light, is a question of substance,

⁹ cf. the work of Bureau d'Etudes.

¹⁰ Oliver Lodge quoting Lord Salisbury. Oliver Joseph Lodge. *The Ether of Space*. Harper & Brothers, 1909.

¹¹ Gilles Deleuze, *Logic of Sense*, Continuum Impacts, London, 2005, 11.

¹² James Clerk Maxwell, *The Scientific Papers of James Clerk Maxwell, Vol 2*, Dover Publications, 1965, 783-4.

¹³ cf. the experimental work of Maxwell, Michelson and Morley.

of materiality, of that which is, in relation to the ghosts, and to the future. It appears at first as a question for science, for physics, a question palmed off to metaphysics, to a now fashionable hauntology, shadowing and ghosting ontology; EM as spectred rationalism, as a dreamlike (Descartes) signalling of the endophysical¹⁴. And this is how we can only ever talk of EM phenomena, if we understand how difficult it is to use these borrowed terms, always too late.

Yet, and this comes as no surprise, again, the door was (always) already open. Jabberwocky science had already acknowledged its own future ghosts of uncertainty. The duplicitous, spectral history of Victorian science, haunted by both a refracting medium, the aether, and its twin, pure abstraction, is easy to recount in these terms.

Notable figures in this case, with excellent pedigree in the literary genre of science fact, include William Crookes¹⁵ and Oliver Lodge, under cover of the aetheric ushering in signal and transmission with a broadcast punctuating the work of Tesla (one year before) and Marconi (one year after).¹⁶

At the same time Lodge features as a noted spiritualist, investigator of psychic phenomena and colleague of Sir Arthur Conan Doyle in the famed SPR (Society for Psychical Research). Physicist Lord Rayleigh, Maxwell's successor as head of the Cavendish Laboratories at Cambridge figures as president of the SPR as a later date. The sign or signature for the theme of reversal is provided by Lodge's posthumous identity test: a series of sealed envelopes (deposited with the SPR) with instructions which could be used to corroborate (future) spirit messages from Lodge himself.

And as mathematician Augustus de Morgan (another ghost, this time haunting the future logic of computers) is quoted in an introduction to Crookes' work on spiritualism:

"I am perfectly convinced that I have both seen, and heard in a manner which should make unbelief impossible, things called spiritual which cannot be taken by a rational being to be capable of explanation by imposture, coincidence, or mistake...

The physical explanations which I have seen are easy, but miserably insufficient. The spiritual hypothesis is sufficient, but ponderously difficult."¹⁷

Finally, the imaginary or parodic apparatus of Edison, sketched out in an early edition of *Scientific American* [1921] is acknowledged as a forerunner of the modern practice of EVP (electronic voice phenomena) and ITC (instrumental transcommunication), expanding and extending the ghosted EM, or aetheric, lineage. EVP methodologies and custom hint at an aether practice which offers a more definitive other side to the radio days; an aetheric noise which is

¹⁴ The endophysical connection being that only outside this dream is there anything called the name of certainty.

¹⁵ Crookes' radiometer, his work with cathode rays, and his well documented experiments with the medium Florence Cook.

¹⁶ Oliver Lodge first transmitted radio signals on August 14, 1894.

¹⁷ William Crookes, *Researches in the Phenomena of Spiritualism*, 1874.

neither transmission nor reception, but which rather remains aside from (cloudy) intention defining these two terms. EVP or ITC can well be viewed as a modern, technology-driven double to both spiritualism, with white noise (Stochastic Resonance¹⁸) and recording apparatus as support or "medium" (for messages from the beyond or beside), and to a phenomena of encoding and decoding, of TEMPEST and encryption.

The communication terms of signal and noise are thus called into a different relation under the Stochastic Resonance (theory) of EVP/ITC fame - white noise; at a microscopic level, the internal thermal noise of a physical circuit (a city) or natural electrical phenomena in the atmosphere - both embraced by radio technology. White noise boosts an otherwise unheard (voice) signal, makes it evident.

EVP and associated phenomena (proof of life after death) proliferate as practise and as anecdote across the global Internet - shared techniques and historical support. The story is traced across colourful figures such as the Swedish Friedrich Jurgenson who first noticed such voices during recordings of birdsong, attracting the attention of Konstantin Raudive (Latvia) in the late 1950s and 60s¹⁹. Hans Bender and Hans Otto Koenig make an experimental TV appearance in the early 80s in which a clear voice is heard to say: "Otto Koenig makes wireless with the dead."

The spirit voices (have) thus become voices from a parallel dimension, a looking glass world. Further, and in keeping with the novel presence of such messages on the magnetic storage medium of the computer, on CRT or printout (ever denying the medium of software), the messages can be seen as originating from a "universal data file," uniting also the dead within this accumulation. And the possibility of a future - a return to the divining boards with brain as "interface," or intermediary. The simple terms of the haunted computer allows us to see that this is all purely a question of interface (again after endophysics).

Yet what is also made evident in the opening quotation is, within the context of a reversal of cause and effect, of original and copy or parody, that not only does Carroll serve as stylistic model, rather equally as a conceptual framework pre-dating a "spooky" science of (un)certainty which we can name as Jabberwocky. Temporal, linguistic, causal and spatial inversions, to categorise but a few, haunt the Looking Glass world of Alice, with, for example, and in paranoiac fashion, punishment preceding trial, and, finally, the crime coming last. Within the chess-move cosmology of the Looking Glass adventure, during a train journey in which Alice is observed by all manner of apparatus, and judged as "travelling the wrong way," a simple conceptual play on words, with head as Victorian slang for postage stamp, allows for the seemingly fortuitous arrival at the following:

¹⁸ Stochastic resonance refers to a phenomena whereby adding (white or coloured) noise to a signal increases the combined signal level, allowing for detection and making sense of otherwise imperceptible signals.

¹⁹ cf. Konstantin Raudive, *Break-Through: An Amazing Experiment in Electronic Communication with the Dead*, Mass Market Paperback, 1971.

"... she must be sent as a message by the telegraph..."²⁰

The message (in advance) becomes easier to decode, within the becoming-paranoiac sciences of (other) encryption. Such conceptual play predates the opening quotation by over 50 years, equally divining the later terms of quantum teleportation; Alice as not just the recipient of a message in the style of traditional encryption summary, but the message in herself. Yet the arrow of attribution is still firmly biased in the correct direction; scientific text equally becomes (self) parody. According to Martin Gardner, Eddington was a great fan of Carroll's Jabberwocky verse, even going so far as to compare certain aspects of scientific discourse with that poem:

"In *The Nature of The Physical World* he points out that the physicist's description of an elementary particle is really a kind of Jabberwocky; words applied to 'something unknown' that is doing 'we don't know what.'"²¹

TEMPEST: encoding that which is

"Any time a machine is used to process classified information electrically, the various switches, contacts, relays, and other components in that machine may emit radio frequency or acoustic energy.

... This problem of compromising radiation we have given the covername TEMPEST."²²

In this masqueraded history of doubles, the always already coded phenomena of TEMPEST provides an easy entry for (theories of) paranoia, and conspiracy - an essential existential relation to the matter which provides a decent lens to observe a parallel (contemporary) landscape of modulation and demodulation, all manner of coherence and detection borrowed from technical terms within the radio day.

On one side of a signal/noise mirror glass, being amongst those always to be compromised, and foreshadowing our rather fishy closing message, TEMPEST is precisely a codename referring to the "investigation and study of compromising emanations" with the latter terms defined as "Unintentional data-related or intelligence-bearing signals that, if intercepted and analysed, could disclose the information being transmitted, received, handled, or otherwise processed by any information processing equipment" according to the *NASA Automated Information Security Handbook* [1993]. TEMPEST refers also to the control of such compromising (aetheric or ectoplasmic even) emanations, within the heady recursion of its own undecodable acronym, with these facts concerning the title suggesting an ideal military state of secrecy, of containment. TEMPEST is thus exactly a codename for that which is always coded in advance - the message after Gnosticism.

²⁰ Lewis Carroll, *Alice's Adventures in Wonderland and Through the Looking-Glass*, Penguin, London, 2003, 147.

²¹ Martin Gardner, *The Annotated Alice*, Penguin, London, 1970, 192.

²² TEMPEST: A Signal Problem, NSA, 1972.

TEMPEST, as a paranoiac form of making sense, becomes part of the inverted message-time equation, that which is always yet to be sent in arriving now, purely as a literary phenomena, some kind of genre confusion between detective fiction and a play with the logic of sense and language which results in the formation of the coded (radio) detection novel exemplified by William S. Burrough's *Cities of the Red Night*.²³ Both this new form of endophysical literature, and a return to Eddington, again by way of the opening quotation, is made clear here:

"Our account of the external world (when purged of the inventions of the story teller in consciousness) must necessarily be a 'Jabberwocky' of unknowable actors executing unknowable actions ... We must seek a knowledge which is neither of actors nor of actions, but of which the actors and actions are a vehicle. The knowledge we can acquire is knowledge of a structure or pattern contained in the actions."²⁴

Light

Light, if we can speak in such simple terms, is key; projected by Maxwell's equations, imposing a clear reference, as bright information (carrier) and as clearing, equally as one term within a Gnostic duality, the double light and darkness, theatre and the plague. This refractive index advances an equal double of signal and noise, a daring question regarding the intentionality of transmission itself, the making sense of any signal which underwrites the study of contemporary EM phenomena.

There stands already (within the equations of TEMPEST) a relation to paranoia, the entrance of the pink light of Philip K. Dick - the modulations of VALIS (Vast Active Living Intelligence System) transmitted within this electromagnetic propagation; modulations he claimed had previously been produced by a Soviet mind control experiment and later skyjacked by the benevolent system orbiting the earth.

Equally the paranoiac work of Thomas Pynchon, day and light within *Against the Day*. Coming to light, revelation, exposure, a transparency or making visible enabled by this crystalline Iceland spar which serves as a doubling - the decomposition of light into two rays (the ordinary and extraordinary, the real and the imaginary component) as it passes through the calcite crystal. Science as a bringing into light, the light of day as opposed to the darkness of spiritualism. Work (and putting the spectrum to work, work and energy and entropy, light as resource and as power) and the day and light.

"Deep among the equations describing the behaviour of light, field equations, Vector and Quaternion equations, lies a set of directions, an itinerary, a map to a hidden space. Double refraction appears again and again as a key element,

²³ Burrough's playback head constructivism: "I recorded a few minutes in all three rooms. I recorded the toilet flushing and the shower running. I recorded the water running in the kitchen sink, the rattle of dishes and the opening and closing and hum of the refrigerator. I recorded on the balcony. Now I lay down on the bed and read some selections from *The Magus* into the recorder." William S. Burroughs, *Cities of the Red Night*, Picador, 2001, 43.

²⁴ Sir Arthur Stanley Eddington. *New Pathways in Science*, Read Books, 2007, 256.

permitting a view into a Creation set just to the side of this one, so close as to overlap, where the membrane between two worlds, in many places, has become too frail, too permeable, for safety... Within the mirror, the scalar term, with the daylight and obvious and taken-for-granted has always lain, as if in wait, the dark itinerary, the corrupted pilgrim's guide, the nameless Station before the first, in the lightless uncreated, where salvation does not yet exist."²⁵

A so-called duality (of wave and particle) in the terms of science describes a world which is held or framed in (un)certainly - the collapse of the wave function as describing a knowing is exactly decryption within the terms of TEMPEST; from Maxwell to many worlds.²⁶

Yet within the noise which maintains that there is nothing but the dream, which says that "the name of the song is called 'Haddock's Eyes'" but that "the name really is 'The aged, aged man'" however "the song is called 'Ways and Means'"...²⁷

Within the beehive noise of Maxwell's belltowered black box, twin fiction pulling the ropes, there remains a single acrostised signal, the name Alice Pleasance Liddell.²⁸

No, but rather, with gentle, gourmandising reference to Schroedinger's equation:

But answer was there none

And this was scarcely odd, because

They'd eaten every one.²⁹

25 Thomas Pynchon, *Against the Day*, Penguin, London, 2006, 566.

26 The many-worlds interpretation following the work of Hugh Everett III.

27 "The name of the song is called 'Haddock's Eyes.' "Oh, that's the name of the song, is it?" Alice said, trying to feel interested. "No, you don't understand," the Knight said, looking a little vexed. "That's what the name is called. The name really is 'The Aged, Aged Man.' " "Then I ought to have said 'That's what the song is called?'" Alice corrected herself. "No, you oughtn't: that's quite another thing! The song is called 'Ways and Means': but that's only what it's called, you know!" "Well, what is the song, then?" said Alice, who was by this time completely bewildered. "I was coming to that," the Knight said. "The song really is 'A-sitting On A Gate': and the tune's my own invention." Lewis Carroll, *Alice's Adventures in Wonderland and Through the Looking-Glass*, Penguin, London, 2003, 213-4.

28 The acrostic within the closing poem, A Boat Beneath A Sunny Sky, on the last page of *Through the Looking-Glass*, *ibid*, 241.

29 Lewis Carroll, "The Walrus and the Carpenter", *Alice's Adventures in Wonderland and Through the Looking-Glass*, Penguin, London, 2003, 163.