

# LORE OF THE RADIO FOSSIL

by

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FADE IN:

Prologue

LOCATION: Sodankylä, Finland

There is a small, isolated lake in Northern Finland,  
100 kilometres inside the Arctic Circle,  
and 1 kilometre from Sodankylä Meteorological Station.

Unseen, the lake's surface oscillates,  
agitated and energetic.

Waves of different media,  
water,  
visible light  
and radio.

Dance,  
scatter  
and diffuse.

[PAUSE]

The hum and rush of an Anthropocene epoch borne on  
radio waves surround and engulf us.

We excite and are excited by its sinusoidal currents.  
We pass through its infra and ultra oscillatory structures,

[PAUSE]

NOTE: READ ISOTOPE NUMBERS IN SINGLE DIGITS

Below the lake's hydrophilic membrane,  
ice-cold sediments rest,  
laced with deposits of magnetic fly ash  
and the radio-active isotopes:  
Americium 241 and Caesium 137,  
generated by nuclear weapons testing post 1954.<sup>1</sup>

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<sup>1</sup> Oldfield, 2015

We will begin our journey with these “nano-artefacts”  
because they are the candidate boundary markers  
of a still informal Anthropocene.<sup>2</sup>

Undisturbed, the isotopes decay at a slower pace  
to the rotting vegetation.

In place of carbon dioxide, they emit  
alpha,  
beta  
and  
gamma radiation.

From the zero time of their synthesis,  
the isotopes keep their own pace:  
intervals eternal in watery depths.

DISSOLVE TO:

#### Scene I: Elemental bodies

FREQUENCY: 10,000,000 THz ( $\gamma$  radiation)

LOCATION: Ollinlampi lake bed, moving to the lake surface

We are travellers in a radio Anthropocene.

Ours is a journey from frequency to frequency,  
from water to air to the near-vacuum of space.

Our interstellar and interscalar lens is the  
elemental body of lake Ollinlampi.

With the technique of a story,  
we sense the lake as it mediates,  
reflects  
and  
diffracts  
electromagnetic interference.

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<sup>2</sup> Nowack and Bucheli, 2007

Some of this interference, we suspect, makes lake Ollinlampi a radio relay into the cosmos.

[PAUSE]

From the magnetic signatures of fly ash to the rhythmic waves of the decaying isotopes, we move up through the lake's turbid waters until we reach its drum-like membrane.

The membrane moves with the arctic air.

It also trembles, perturbed by very low frequencies generated by teleseismic activity and heavy weather events, which permeate its watery media in infrasonic waves.

CUT TO:

### Scene 2: Magnetosonic

FREQUENCY: 1 - 20 Hz

LOCATION: Troposphere, moving to Stratosphere

Infrasound is composed of longitudinal airwaves of compression and expansion.

Clouds may form along the crests of these waves: visible striations of an invisible and inaudible field.

To invoke a radio Anthropocene is to imagine another wireless world in which limits of visibility and audibility are suspended as we become radio-beings.

As we frequency-shift from the membrane of lake Ollinlampi, the atmosphere above is evanescent with multiple waveforms.

We are entering a bandwidth of signal traffic, man-made interference and information scattering from communications devices.

If “the sky is only an antenna with a wide range”,  
radio is a transducer of a multiplicity of  
wireless events:  
telecommunications,  
synchronisation,  
industrial,  
infrastructural  
and commercial activity.<sup>3</sup>

The Earth’s atmosphere is an electro-acoustic media  
capable of holding and transmitting these varying  
emissions and modulations,  
in simultaneity and perpetuity.

CUT TO:

### Scene 3: Transient luminous events

FREQUENCY: 61 Hz

LOCATION: Ionosphere, magnetosphere, moving to the Earth’s outer radiation belt

Our radio Anthropocene is luminous and sonic.

We follow the signal traffic to the edge of  
the ionosphere and to the Earth’s natural radio:  
a musical electromagnetic phenomenon caused by  
interactions between the magnetosphere  
and the Sun,  
lightning strikes,  
whistlers,  
sferics and the dawn chorus.<sup>4</sup>

As we reach the outer radiation belt,  
magnetosound from “giant - micro - pulsations”  
of mysterious origins form waves that resemble  
“pearl necklaces”  
and propagate over great distances  
as aelectrosonic murmurs.<sup>5</sup>

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<sup>3</sup> Breton via Kahn, 2013

<sup>4</sup> Eckersley, 1935

<sup>5</sup> Kahn, 2013

[PAUSE]

Since Sputnik's launch in the International Geophysical Year of 1957, thousands of satellites encircle the Earth.

Their electromagnetic emissions envelop the globe in a second atmosphere, a technosphere.

Through their mirrored eyes we practice inverted astronomy of "looking down from space onto the earth rather than from the ground up into the skies".<sup>6</sup>

In polar orbit at 700 kilometres altitude, Sentinel-1A and Sentinel-1B are radar imaging satellites operating in the C-band at just over 5 Gigahertz, with a swath width of 250 kilometres and geometric resolution of 5 by 20 meters.

Amidst a multi-spectral politics of sensing and signal processing, the satellites carry out the capture and transmission of an image.

[PAUSE]

We attach our radio-selves to the image data as it leaves the Sentinels at 8095 Megahertz and 520 Megabits per second in the direction of Sodankylä.

CUT TO:

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<sup>6</sup> Sloterdijk, 1990

Scene 4: Errant transmissions

FREQUENCY: 8095 MHz

LOCATION: Ionosphere, returning to Sodankylä and ground level

Spectre-like,  
the feed passes through other transmissions in a  
preordained choreography determined  
by the strata-like bands of Frequency Allocation Charts.

To those who can sense its coming,  
the data manifests as a sinusoidal melody.

Unobstructed, the satellite transmission is pristine,  
prismatic.

[PAUSE]

A fragment is captured by the Meteorological Station.  
The majority is absorbed or backscattered by surrounding  
vegetation,  
rough ground  
and nearby bodies of water:  
Kitinen river  
sylvan lakes,  
including Ollinlampi, where we began.

The lake is transformed.  
Agitated by the data feed,  
its waters become a “radio mirror”.

Ollinlampi does not scatter,  
it reflects.

HARD CUT TO:

Scene 5: Earth images

FREQUENCY: 0 - 300 GHz

LOCATION: Ollinlampi lake surface, to exiting the heliosphere

The raw image travels on multiple frequencies,  
its prismatic quality fractured.

Earth's image is an electromagnetic anti-pattern.  
A new and vagrant signal.  
A radio fossil.

[PAUSE]

The fossil captures multiple techno-geographies.  
It began as a photograph of the Earth  
and is now textured by the electromagnetic conditions  
of the planet.

It intermingles with human-made signal traffic,  
thermal noise,  
radio of geomagnetic and atmospheric origins,  
the Sun's polyphonic outbursts  
and cosmic background radiation,  
which peaks at 120 Megahertz  
in harmony with Jupiter at 40 Megaertz.

In marking these traces we are witnessing an event  
of transperception:  
"a poetic disjuncture of immanent distances  
and large powers".<sup>7</sup>

The fossil tells a shimmering, electromagnetic story of  
its zero-time,  
its elemental journey  
and its ultimate diffraction.

There is a poetics in knowing that  
the fragments of a raw image of Earth,  
are now textured by the Earth,  
travelling into space.

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<sup>7</sup> Kahn, 2013



The radio fossil is an Earth-image,  
a coded artefact.

Attenuated,  
dispersed  
and foreshortened,  
as the air thins to darkness.

[PAUSE]

The near-vacuum of space is the ideal  
“environmental archive” for the fossil.<sup>8</sup>

As it departs from us,  
always expanding,  
the scale of the fractured Earth image grows:  
1:20,000  
1:10,000  
1:5000  
1:1000  
1:500  
1:20  
1:1

FADE OUT

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<sup>8</sup> Oldfield, 2015

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