

OTOLITHS,
AQUEOUS NOTES

by Akina Yoshitake Lopez

*

At the Luxembourg’s National Museum(MNAHA) we were told about ancient regional burial rituals. One story was about an excavated skeleton hiding a precious stone inside its skull—most probably a sign of the deceased’s social importance and the promise of an after-life therewith.

We exist upon what precedes us. The motion of writing and reading arises from the stone’s least apparent mutability and the script’s greatest mutability. The progression of texts is epigraphic: tombstone and version, indistinguishable.
[Fiama Hasse Pais Brandão, Era, my translation]

A fish’s body is said to have a density similar to that of the water surrounding it. In some species, the inside of the inner ear holds small stonelike crystals of calcium carbonate called otoliths (from the Greek *ōto* (ear) and *lithos* (stone)) the density of which are three times that of a fish’s body. Aristotle referred to these species as “fish with stones in their heads.” Otoliths are part of a fish’s orientation and auditory systems. Variation caused by the body’s movement and by the sonic environment produce tension between the density of the otoliths and the hair cells that connect them to the sensory epithelium. **They weigh and lag their sonorous tópos.**

I once read that listening was *not about remembering but about arresting the detail and being arrested by it in a way that sound might take you before it moves back and forward: an escape hatch of dwelling resonances where linear time collapses and listening exceeds its own excess and instrumentality*.¹

<SONOROUS TÓPOS 1>
three days before a new moon,
Colorado Delta River in Mexico

It is spawning season for the Gulf Corvina, an endemic species of fish with otoliths. During the reproduction season, corvinas produce a deafening synchronized loud chorus, the sound intensifying during high tides. *Male Corvinas produce sounds during spawning, and their collective mating choruses reverberate through the hulls of small fiberglass fishing boats and are audible to the naked ear*²,

Fishermen may hear the aggregation from afar and may feel the fiberglass boat **vibrating under their feet** (sounds as loud as a jet’s landing can be heard over a distance of 72 kilometers).

A call and a risk of collapse. Fishing nets encircle the chorus. Instrumentally.



Imagine a near field, an Atlantic motion... it is night, figureless *“is coming”* directionally x, y, z within chambers, aqueous passages epithelium *(how thinly tensioned)*

sagitta, lapilli, and asterisci
the **arrest** exceeded the naming in low frequencies of oceanic tenses

Imagine a choir, little aqueous drums... density delays its tense senses stones tones of waves of currencies carrier bags moistured notes *(I cannot hear)*

x, y, z within
I saw a fish head being precisely opened. it was a removal. it was its otoliths. excess silenced my skin *(I could not hear)* but the chambers, but the weight of carrier bags

(but this becoming stone holds no steady surface for image-reflection) “is coming”



ECCE (“behold” in Latin), detail from Big fish eat small fish, engraved by Pieter van der Heyden from Pieter Bruegel’s 1556 drawing.

At the bottom of the engraving is an inscription in Dutch: *Look son, I have long known that the big fish eat the small.* The engraving portrays fishermen. A father shows his son how marine predation works. “Behold!” he cries, pointing his fingers to the amount of smaller fishes swallowed by bigger ones. The son points to the same force-scaling on their side.

A knife, entrails opened, and mouths opened.

This engraving has been reproduced in various versions. In a version from 1557, the inscription at the top reads: *The oppression of the poor. The rich suppress you with their power. Letter of James, 2:6.* In another, an anonymous drawing from 1619, the big fish is labelled with the name of a Dutch statesman and the big knife captioned as “the knife of Justice.” “Behold!” I stare at the space where *ECCE* is inscribed. Hands either pointing or cutting open. The scale of big/small or rich/poor becomes tangible through their hand gestures.

Behold
the force of their lines.
Behold
their curves and angles:
fingers, mouths, blades, and flesh.

With his 1928 “Manifesto Antropófago”, the Brazilian writerOswald de Andrade refutes an “unprocessed” European hegemony within the Brazilian cultural production. He presents a utopic-philosophic treatise on the symbolic gesture of devouring, in reference to an indigenous practice narrated (around Bruegel’s time) about the encounter with the colonizers: to devour the enemy, its strengths, its differences. Not as food, but as symbolic constant re-constitution.

No undifferentiated deglutition.
Saliva, *papier mâché*

The gestures of “swallowing” as referred to both in the engraving and the manifesto, deal with force and oppression. Justice and deglutition somehow carry the transparency of the content. The small remain small, and the strong keep their strength. Bodily symbolic. But as far as force is concerned, *nobody really possesses it*.⁴

*

(chaos-chanting close to the water for the possibility of other gravitations chants of bittersweet tenderness, of contradictions to hold)

a saliva as historic as birth amidst nurture as tender as hope that is due. that is second, centered, contradicted a tear *hearing dominates amniotic life*⁵

(chaos-chanting close to the water listening exceeds its own excess and instrumentality it, unfathomable, irreversible)

*

<SONOROUS TOPOS TWO>
preparation for a hunt during the
Paleolithic era,
Lascaux in southwestern France

It is the making of flints, knife-like tools used for hunting. The sound of striking rocks together creates loud percussive sounds, reverberating inside the cave like the thundering sound of bulls' hooves. Large mammals are represented on the cave's walls on which the sounds echo very clearly. Possibly, the hoofbeats imbued in making tools were part of the pacing/piercing of hunting: a kind of sonic relation between the cave and the herd through the artefact. The sounding blades forged within past pictorial triumphs, warnings, fears ...

an atmospheric listening exceeding its
acoustic
phenomenology
its caves, its hulls, its chambers
with its flints, fears
infra-porous, vaporous

I return to the removal of the otoliths
its incision blade, its three-parted emptied
chambers,
its viscosity
it happens that since long,
these stones in some fish's heads meant
something
in different social imaginaries.

*'If while eating a fish you find its otoliths,
you'll return someday to the place
where the fish was taken from'*

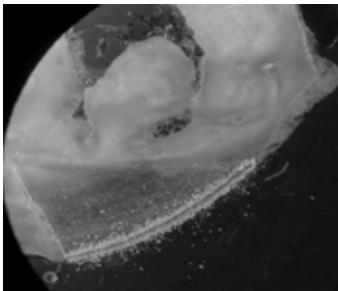
*'If turbulent lines are seen in otoliths,
as wave-like mimetic signs
a fisherman better refrain from the sea'*

*'A man was buried with hundreds of otoliths,
for the quest and wonder
of archaeological imagination'*

I imagine the counting in their hands,
for there were days, places and
populations.

*

<SONOROUS TOPOS THREE>
the continuous laser-scratching of surface,
microscopic device in a laboratory, Brazil



A biochemical scan is conducted by a marine biologist on otoliths collected from the Brazilian coast. Through digital technology and datasets, it is possible to map migratory flows using precise vector-like tracing of an otolith's surface. Otoliths accumulate traces like ring trees. The biologist showed me how to collect the dust-like data with a cotton swab, while holding her breath inside the device's micro chamber to avoid blowing it away.

The precision of the biochemical tracing,
more precisely the digital image,
more specifically still the sharp line
in a linear time created a vertigo inside
my ears.

*

<SONOROUS TOPOS FOUR - I>
Murchison, Australia, 1969



More than a hundred kilograms of a meteorite were witnessed falling from the sky. collected, analyzed. As far as age analysis goes, there are 2.5 billion years between this material's formation and our solar system. It is presolar. *Dust lifetime estimates mainly rely on sophisticated theoretical models. These models, however, focus on the more common small dust grains and are based on assumptions with large uncertainties.*

<SONOROUS TOPOS FOUR - II>
Archaeological site Jabuticabeira II,
Brazil, late 1990s



An excavation at a *sambaqui* (shell mound) in Brazil, dating possibly back to around 900 BCE until 400 CE, uncovered the skeleton of a woman, between twenty-one and thirty-six years old, buried with the otoliths of over five hundred fishes. No heads, just otoliths. corvinas and catfish.

The deposition of skeletons or animal parts next to the burials is closely related to the mourning process of the communities and certain species were specially selected for commemorative feasts and the construction of memorials for the dead, at least in some regions. (...) The populations did not live or were buried in the remains of everyday meals, but were surrounded by powerful animals?

it matters scaling a near-far,
amounting present
as manners of dating matter: how it says a common
(era)
daily sunlight, everyday meals, the dust
and the dying

how far is the dying ceremonial ground
from the fishing basket
what swirls before theories as clouds of
gas and dust

*a corvina swims into proto-radius passages:
it goes, gravitates
for billions and billions of words:
they ground
what comes from the sky, what uncertainly engrains*

There is something called the "bomb pulse." Carbon-14, or radiocarbon, is a radioactive isotope of carbon present in organic matter. Its measure is used as a dating system for archaeology and geology. It happens that from 1945 until around 1963, due to intense above-ground

testing of thermonuclear weapons, the amount of carbon-14 doubled. 1963 is the year of the Nuclear Test Ban Treaty. *In essence, every carbon pool on Earth which was in exchange with atmospheric CO₂ since the late 1950s has been labelled by bomb carbon-14.*

As carbon isotope goes through some sort of decay, current levels are approaching pre-bomb values.

harmless, a silver line, they say
a biochemical synchronization into a
graphic curve
forensic dating

**(may mnemonic echoes that no naivety
pierced the sync
to date
*)**

the known regions where corvinas
abound
the forceful decade of nuclear
experimentation
the balance weighing heaps of interstellar
dust

1. S. Ruiz and H. Vourloumis, Formless Formation: Vignettes for the End of This World (London: Minor Compositions, 2021).
2. B. E. Erisman and T. J. Rowell, "A Sound Worth Saving: Acoustic Characteristics of a Massive Fish Spawning Aggregation," Biology Letters (2017).
3. Oswald de Andrade, "Cannibalist Manifesto," Revista de Antropofagia (São Paulo: 1928)
4. Simone Weil, The Iliad, or The Poem of Force (New York: Pendle Hill, 1978).
5. David Toop, Sinister Resonance: The Mediumship of the Listener (London: A&C Black, 2010).
6. P. R. Heck et al., "Lifetimes of Interstellar Dust from Cosmic Ray Exposure Ages of Presolar Silicon Carbide," Proceedings of the National Academy of Sciences 117, (2020).
7. D. Klokler, "Otólitos, para que te quero?," Revista de Arqueologia 29, no. 1 (2016). (My translation)
8. P. R. Heck et al., "Lifetimes of Interstellar Dust from Cosmic Ray Exposure Ages of Presolar Silicon Carbide," Proceedings of the National Academy of Sciences 117, (2020).

Audiovisual performance/ text (3 min.)
in collaboration with Lance Laoyan
Special thanks: Casino Display
Luxembourg, Luxembourg's National
Museum (MNAHA), Hugo Lopez, Mariana
Lopes, Lucas Silva and Mario Polo.
/ May 2025