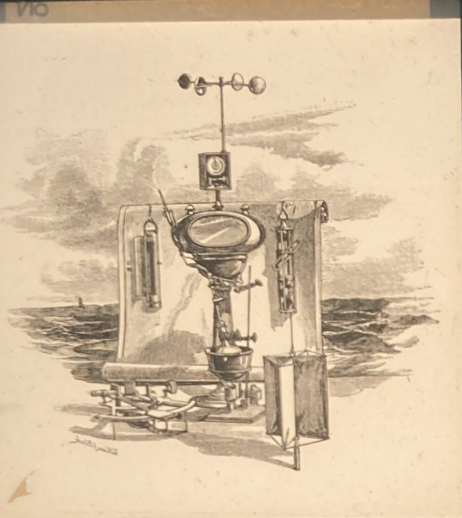




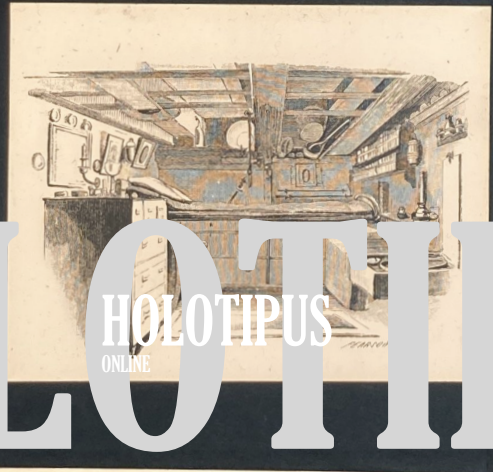
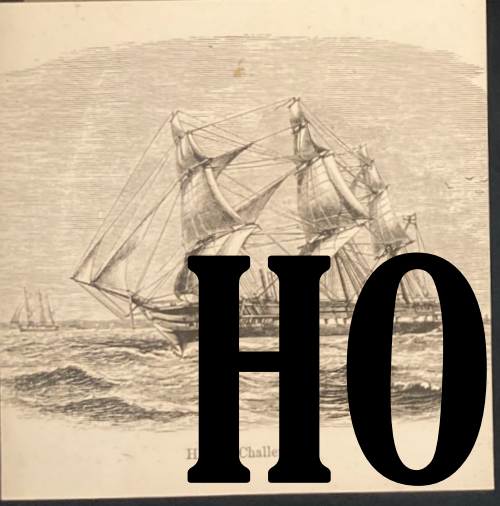
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Fluid States of Matter and Meaning: Anarchiving the Oceanic

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Abstract: Oceanographic archives are key repositories for the Anthropocene thesis. Readings of culture and the environment through archival epistemologies and mediations are gaining increasing attention amongst scholars in environmental humanities and media studies. Through the methodology of ‘anarchiving’ we raise questions about the fluid states of matter and meaning within archives. The context of this transdisciplinary project is the National Oceanography Centre (NOC) archive in Southampton (UK). In this article, we explore oceanographic materials through a collective process of ‘anarchiving’, which involves critically engaging with archival taxonomies, visualising techniques, and sensing regimes of oceanography working on and beyond the organising forces of the archive. In doing so, we expand upon the question of how ‘oceanic’ environments are transcribed and read, and reflect on the fluidity of an archival approach that centres association and encounter.

Each part of this article disrupts representations of bodies of water as data, language, images, preserved objects, and signs. The article begins with our cautious entry into the archive and gradual acclimatisation to its anxious pulse (part 1). We witness the instrumentalisation of the animal through whaling maps and artefacts (part 2) and vital moments of encounter with underwater photographs (part 3), while cold-stored film preserves the colonial pursuits of oceanographic expeditions (part 4). Finally, a set of sea surface watercolours provokes a planetary view on oceanic matter and meaning (part 5).

KEYWORDS: Water bodies; knowledge; anarchiving; planetary; oceanography.

Introduction

When looking at the Anthropocene as a subject of ‘environmental relations that need to be continuously invented’ (De la Cadena & Bruun Jensen, 2015: 161) we can engage with archives as sites and systems documenting these relations through different media. This involves a search for analytical tools that, like the very drift of the concept of the Anthropocene into Capitalocene, Plantationocene, and other denominations, record the inventive production and organisation of the human and the non-human. One of the main functions of an archive is that of inscribing a beginning (*Arkhe*) or an origin to its collections to allow its users to create meaning that extends beyond its designated repository. It is not difficult to see why the concept of the Anthropocene is entangled with that of the archive: the latter reproduces worlds of environmental relations, which are now at stake.

In this article, we shift our gaze to oceanic matter embedded in an oceanographic archive, allowing us to unravel ‘the oceanic’ in broader scientific and cultural understandings. This approach pays attention to the ‘intensive co-emergence processes of natural dynamics and media cultural epistemologies,’ which Jussi Parikka has named medianatures (Parikka, 2018). How do oceanographic archives, among other environments of knowledge and mediation, invent, produce, and reproduce natures within and beyond disciplinary fields? In the encounters we document, we employ anarchiving to challenge archival immutability, together with the politics and sensory regimes that dictate what counts as ocean matter, knowledge, and data.

Anarchiving is an active practice grounded principally in digital and artistic disciplines. Coined by Siegfried Zielinski, a media archaeologist, anarchiving has been used in transdisciplinary contexts to open up and reassemble the archives into ‘unforeseen configurations’ that challenge colonial trajectories of discovery and rediscovery (Lessard, 2009: 317). Zielinski’s essay ‘An Archeology for AnArchives’ creates a basis for our own encounters with archival material and provocation of a ‘rule-bound administrative apparatus’ (Zielinski, 2015: 122). Zielinski writes that archives do not: ‘lay claim to leadership. Nor do they claim to truthfully know where things come from [...] the origin is and remains a trap. [...] They indulge in waste and offer presents [and they] are indebted to a single economy, that of friendship – an acute feeling of strangeness in the world, which we occasionally share with others’ (ibid).’

These feelings of ‘strangeness’ recall the ‘picturing of absence and wishes’ that Bethany Nowviskie raises as a necessary capability of speculative collections, as ‘stages to be leapt upon by performers or co-creators of future histories’ (Nowviskie, 2019: 12). In this spirit,

we leapt into the strangeness of the underground collections at the UK National Oceanography Centre. Here, we co-create our encounters in five parts differing in tone and voice, reflecting our own ways of knowing and encountering archival materials. Writing as five transdisciplinary scholars, we expand on a series of video essays resulting from several visits made together in 2022 to the NOC archive¹.

I. Anarchiving: Ungloved

Just outside the archive’s door, the grey monolith of the ‘never locked’ Library Disaster Cupboard stands guard for imminent epistemic danger: the leaks that never come, flood water returning to dried materials lifted from the seabed or plucked from the mouths of cetaceans, or just general graduate student misbehaviour. Passing through, one is met with a flashing panic alarm adjacent to the digital repository, and ‘do not touch,’ ‘fragile’ signs folded into dozens of boxes. Alongside the panicked whirring of temperature controls and frost protectors, sensed in this archive is a feeling of uneasy and anxious preservation, reflective of the ‘deeply epistemic anxieties’ Ann Laura Stoler attributes to the archives’ attempts to maintain colonial common sense (Stoler, 2010: 19). Surrounded by these beeping, whirring, and blinking systems, the ‘pulse of the archive’ felt rapid and fraught and, in response, we moved with caution at the start of our archival navigation. As if automatically acceding to the orders of common sense, we felt reluctant to rock the boat, extend our bodies to reach certain materials, touch collections, or allow our voices to surpass a whisper to avoid evoking archival suspicion.

The body’s material and leaky presence within the archive is a threat to the permanence of both archival records and its systems of common sense. Not only does it pose a risk to the preservation of archival objects, but its senses and affects pay attention to knowledge that cannot be rigidly categorised or ordered. Despite the pleasure that can be found in the ‘tactile experience of engagement – to touch, literally to commune, with the dead’ (Bernard, 2011: 97), the exorcism of the body’s sensing machinery from the archive has endured. In the article ‘Misperceptions about White Gloves,’ Baker and Silverman (2005) outline the culture of preservation behind the adoption of white gloves to handle artefacts. Correcting misperceptions of white gloves’ advantages in these settings, Baker and Silverman conclude that there is a dangerous ‘blunting of the sense of touch’ (2005: 1). As such, we move with ‘awkward mobility. Loss of feeling [and] impaired sensations’ (2005: 1). Though gloved reading practices in this archive were not required, there was still a lingering sense that the body was banned from these archives while the mind was admitted and that the body and objects of knowledge may never commune for fear of material damage.

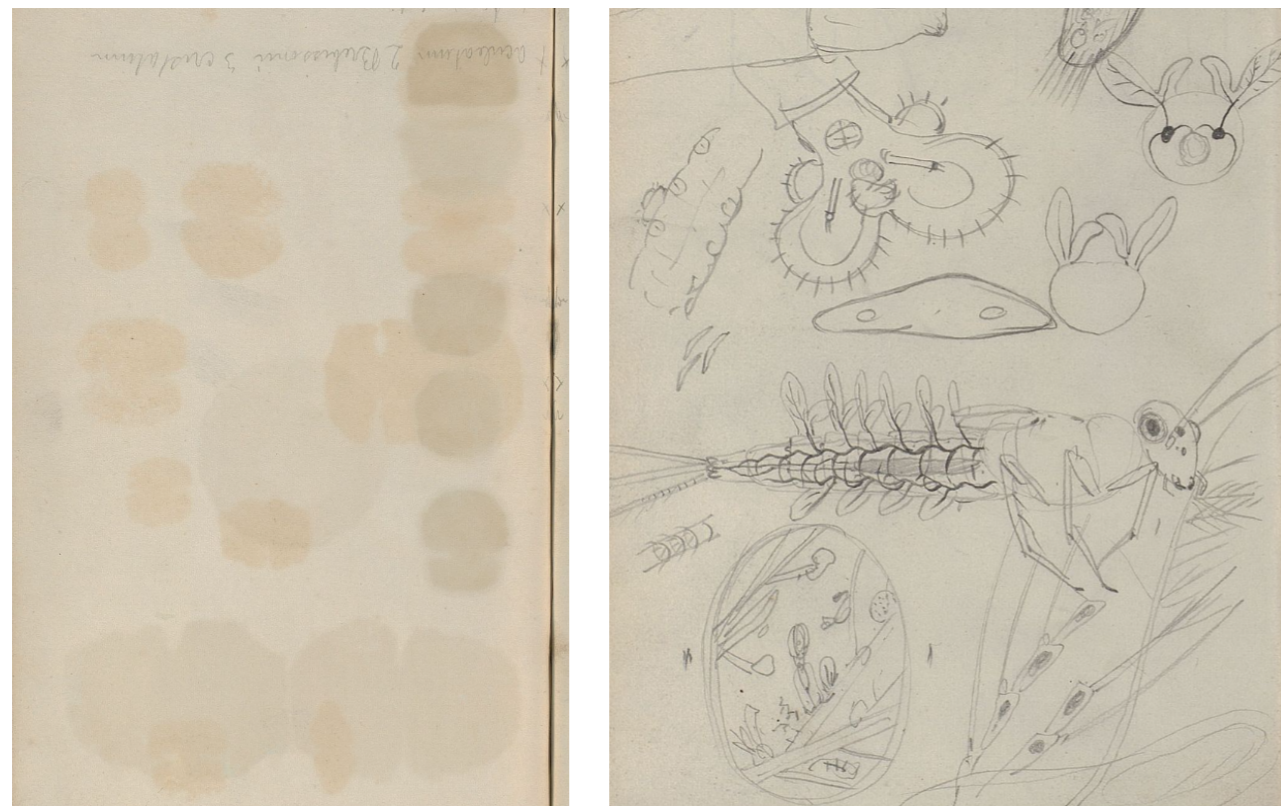


Figure 2.

Image of humidity damage on F.W. Millett's 'Drawings of Foraminifera, Diatoms etc.' And image of adjacent page of foraminifera from Plate XVIII (collection of plates from published works). 94629845. University of Southampton Library, University Road, Southampton, SO17 1BJ.

Hennessy and Smith, in their investigation into the degradation of archival objects, find a component of anarchiving to be 'fugitivity.' In their conclusion, fugitivity is a mark of 'telling degradation,' one that questions the durability of Western knowledge, whether this is the rot of book bindings, the yellowing or rip of parchment, or the obsolete machinery used to view these old objects (Hennessy and Smith, 2018: 133). An example of this in the NOC is F.W. Millett's *Drawings of Foraminifera, Diatoms etc.* An English foraminiferologist, Millett was instrumental in the taxonomic study of the *HMS Challenger's* samples of foraminifera and diatoms, a record that helped to discount the standing 'azoic theory' of ocean life below a certain depth. Visible humidity damage has led to the impressions of diatom watercolour plates on the opposite pages in an archival bloom of ghostly traces (Millett: Plate XVIII). An unstable record, algal impressions accumulate and merge onto opposite pages. These ghostly traces also exist throughout the collection and within the *HMS Challenger's* reports as the unknowing illustration of extinct foraminifera from the middle Pleistocene. On another unnamed page, Millett's preliminary but authoritative sketching of diatoms and foraminifera is re-worked into a flying ant riparian scene, featuring

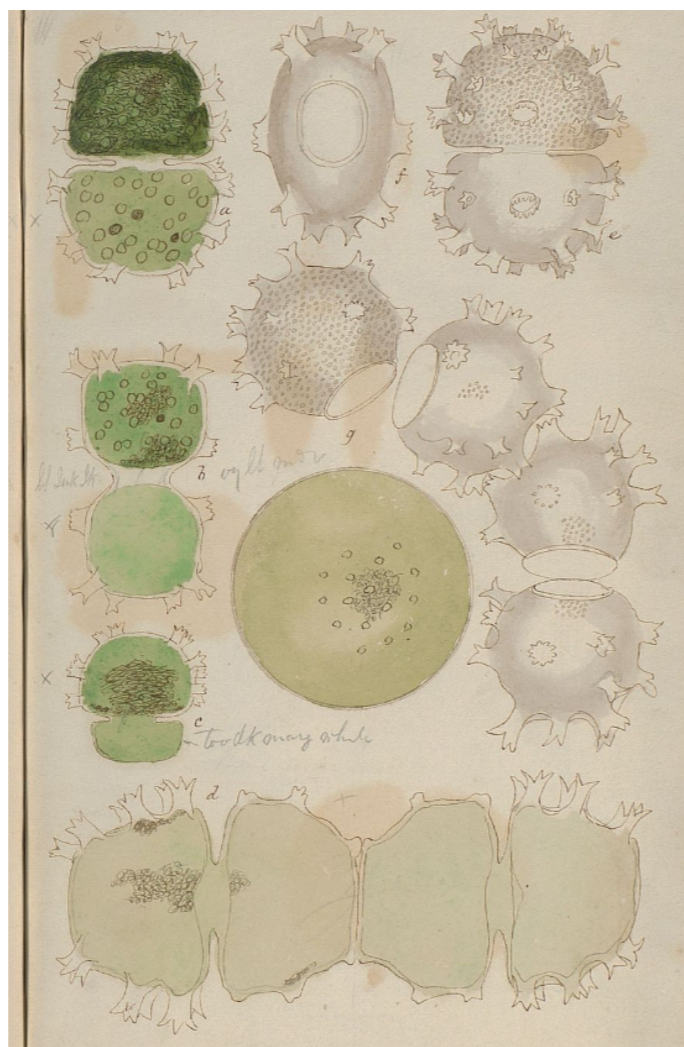


Figure 3.

Image of casual sketches produced by F.W. Millett in *Drawings of Foraminifera, Diatoms etc.*

river grasses and insects possessing micro-algal bodies (perhaps inspired by Millett's immediate surroundings). This playful rendition of microscopic data, scaled out and sketched in pencil, becomes anarchival in its disregard of common, permanent sense. It also contains sensory and affective data from the scientist himself: what he was experiencing behind the production of the plates, producing an impression of absent-mindedness.

Millett's records relieved the archival tension, and we collectively moved to an uncommon sense of subjective understanding. Our anarchival approach became 'ungloved' or bare-handed in the sense that, although still respecting archival objects, we sought greater connections between the miscellaneous, the rediscovery of sensory intimacy with the historical oceanic materials we handled, and aimed to attribute 'uncommon sense' to Western colonial systems of taxonomizing and ordering. When bare-handed, touching whale teeth, underwater cameras, squid slides, and film reels, taking the pulse of the archive is easier and our sensations less impaired. Plays with uncommon sense in the digital archive amounted to a human mattering of scientific knowledge. The Archive ceased being a 'dead zone' in the abyss of the basement and became alive with materiality.

2. The Open Ocean in a Whale's tooth

'It might seem an absurdly hopeless task to seek out one solitary creature in the unhooped oceans of this planet'

Herman Melville, *Moby-Dick*
Chapter 44 'The Chart'

On the dusty shelves, an uncatalogued whale tooth rests between an old analogue barometer and atmospheric measurements from the Cold War period. This remaining piece of the giant mammal possesses the potential to anarchieve a story of rational and cartographic understanding of the high seas, as well as the diminishing role that whaling played in the archival formations of oceanography.

Sperm and right whales give us an example of primitive accumulation for the nascent scientific societies of the 19th and early 20th centuries. Not solely as a key oceanic resource being targeted in industrial markets, but also as new territories for the generation of oceanographic knowledge. Whales became matter for all sorts of archival operations: a mappable energy resource; the material reference for measuring light – the lumen – taken from the combustion of a 24 gr sperm whale candle; even for Victorian naturalists studying deep-sea specimens such as giant squid found in sperm whales' stomachs. Anarchiving the whale tooth entails paying attention to these organisational forces and media operations of oceanography, metrology, cartography, even meteorology, by reading whales' bodies 'across archives' (Lowe, 2015). As argued by Jussi Parikka and Rebecca Schneider in their media-archaeological take upon remains: 'The archival remain always have a topology [...] What set of places pertains to remains, [...] what sort of institutions of memory, as well as what sort of practices?' (Jucan, Parikka & Schneider, 2019: 3-4). This is how the uncatalogued tooth took us to another archive and time, to Lieutenant Matthew Fontaine Maury's desk at the US Navy's Hydrographic Office.



Figure 5.

Matthew Fontaine Maury (1806-1873). *Whale Chart of the World, Series F. NO. 1. 1852.* Compiled from materials in the Bureau of Ordnance and Hydrography (detail). Brown Olio. Brown Digital Repository, Brown University Library (<https://repository.library.brown.edu/studio/item/bdr:41233/>).



Figure 4.

Photographs by the author taken in the archives of the National Oceanography Centre (Southampton) in April 2022. The whale tooth is on the left and atmospheric measurements dating from 1978 are on the right side.

Between 1851-1852, using several hundred logbooks from whalers' fleets across the ocean, including those of Herman Melville onboard the *Acushnet* (Nègre, 2022: 8), Maury gave form to a map of right and sperm whale sightings across the ocean: 'The Whale chart of the World'. The cartographic technology of the grid provided Maury with a pre-existing geometrical space in which 'objects' could be placed and stored in addressable units (squares). As a tax instrument

used in colonial administrations, grids had already set the epistemological precondition for land dispossession, i.e., the creation of an empty space (Siegert, 2015: 98), and the ground for visualising discrete and directional movements of matter.



Figure 6.

Enlarged frame from the 'Whaling Chart of the World', Series F. NO. 1. 1852. Compiled from Bureau of Ordnance and Hydrography materials (detail). Depicts sperm and right whales. When animals are not present but stragglings are spotted Sperm whales are depicted with a single blow and right whales with a double blow. The letters (v) stand for spring, (a) for autumn and (s) for summer. An empty square is marked with an X for unknown reasons.

In Maury's hands, whalers' visual skills and embodied sensorial experiences on the high seas became a data landscape to be taken as a territory. Once divided into districts of five degrees of latitude by five degrees of longitude, filled with days spent per month in every district, and the days of sperm and right whale sightings, the charted open ocean anchored an instructed body onto a calculated surface, and whales became foreseeable oceanic matter. From then on, whales would be chased by calculation. Interestingly, the high seas perceived from the whaler's eye and compartmentalised on Maury's desk is already a record of anthropogenic action on a global environment. By centering the chart on the Pacific Ocean, Maury was not depicting 'the primary habitat of whales' as he thought, but the consequence of the already depleted whale resources in the Atlantic, making the industrial hunt for right and sperm whales a fundamental part of the visual and spatial configuration of the high seas—thus extending to the mapping of climatological and meteorological entities that take shape in this environment.

Just as different parts of the whale's body were processed and allocated to different industries, whales' own seascape intelligence was processed as data, feeding the empty squares of oceanography and meteorology on the open ocean with temperature, water colour, and wind directions. From his grid-shaped data territory, Maury concluded 'that the tropical regions of the ocean were to the right whale as a sea of fire into which they never enter' (Burnett, 2005: 133). Not far from this point of view, in a primitive form of remote sensing, William Scoresby Jr observed from recovered harpoons that right whales shot in the North Atlantic were sometimes



Figure 7.

Photographs taken by the author in the archives of the National Oceanography Centre (Southampton) in December 2021. Slides arranged on a lightbox by the archivist.

later captured in the North Pacific. Then, if right whales appeared on both sides of the Americas but could not cross the equatorial 'sea of fire' there should be 'a communication in open waters [read here as temperature] between the Bering Strait and Ban Bay' (ibid). In this way, harpoons and grids became archival instruments to geolocate open ocean dynamics extracted from the whale's-body-in-the-environment.

If the Anthropocene archive forces us to reconsider oceanic matter, it should do so as a remainder of the close links between knowing and dwelling, media and 'mediums for life' (Peters, 2015). Coupled with the deadly industrial western sensorium, and its colonial inheritance, whales began to show a connected system of global ocean dynamics, including the first indications of the Gulf Stream's connection to the North Atlantic Circulation System, while disappearing



Figure 8.1 & 8.2.

On the bottom, a diagram of the underwater camera modified for midwater use. From Baker (1957); National Oceanography Centre Digital Library (Link online to the reference). On the top left, Laughton posing with the underwater camera. From Laughton, 1957.

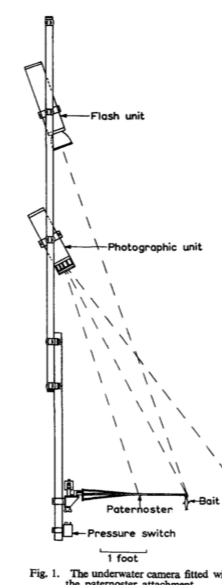


Fig. 1. The underwater camera fitted with the paternoster attachment.

in an epistemic, archival and ecological sense. Now that these ocean dynamics have become the data landscape within the grids of climate science – and we cannot demarcate ourselves from these calculations – they also need to become a territory for revisiting and redesigning the human. The forgotten whale's tooth offers a starting point in those lives lived as data, a humble gesture that however dislocates archival products and media operations, turning knowledge back to the world.

3. Brief Encounters with Midwater Squid: Underwater Photography on the *RRS Discovery II*

The archivist had arranged a selection of slides on a lightbox as an appealing

display for first – time visitors. In luminescent harmony with faded etchings of boats and shells from the *HMS Challenger* expedition, four blackened slides drew me in. A violently white stick, a spiky,

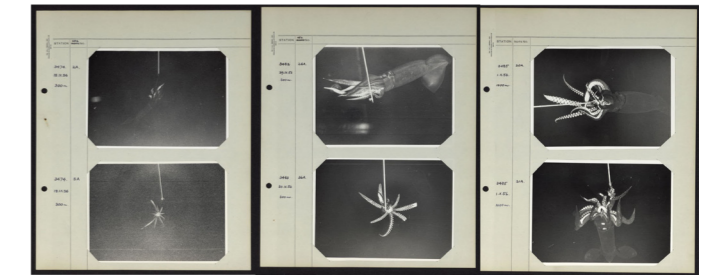


Figure 9.

Three pages of the album chart Laughton's efforts to capture closer, sharper images of squid, first at 300 m, then 600 m, then 1000 m.

inhuman splay of limbs caught in a struggle, an organ seemingly alienated from a larger body; a soft-hard torpedo. As flashes from an unknown struggle, these images made me feel something quite different from the duck-egg paperiness of record cards or cracked keepsakes in cardboard boxes. I turned to the digital archive for answers, delivered in the virtual form of a green cloth-bound album of 30 snapshots ('Photograph album of squid taken with underwater camera', 1956). These document the efforts of oceanographer Anthony Laughton to take midwater photographs with an experimental underwater camera, lingering outside the Açores for three weeks aboard the *RRS Discovery II* in 1956. Suspended beneath the ship, the camera was originally designed to autocapture photographs of the seafloor by triggering a flash bulb and shutter wherever it touched the bottom, being repeatedly raised and lowered like a pogo stick to produce a regular series of images (Laughton, 1957).

Laughton and colleagues modified the camera for midwater use by attaching bait to an arm at the base of the unit, in turn connected to a spring that would trigger the camera when the bait was tugged. They intended to photograph squid at depth, to confirm the presence of species they had only lured to and observed at the surface, or recovered from the stomachs of whales. The camera encountered at least three individuals, unknowingly taking selfies while struggling to detach the bait or becoming ensnared in the hook. Over the three weeks and 15 pages of the album, lowering the camera from 300 m to 1000 m, Laughton adjusted the setup to capture closer, sharper images of the squid: embarrassed in the glare of the flash, limbs awkwardly outstretched and eyes shining.

Released in the same year to international acclaim, Jacques Cousteau's film *The Silent World* (1956) offers comparable documentation of playful yet violent rudimentary underwater encounters. His book of the same title, published with fellow diver Frédéric Dumas in 1953, documents the exploits of his crew of 'menfish' as they caroused around the ocean, teasing and tormenting marine life. With hazy mention of geography or rationale, scenes of dynamiting reefs, clubbing shark on deck, forcing terrorised octopi said to be 'most submissive when very tired' (Cousteau & Dumas, 1953) to dance with divers, and harpooning a juvenile whale mutilated by their boat's propeller stand out among the footage. Both the original and contemporary contexts of *The Silent World* and Laughton's squid photographs unquestionably differ, in terms of both their creation and reception: one today an eclectic showpiece of an underground archive, one remaining a lauded and influential landmark of popular science (Duncan, 2018). But both record encounters, fleeting, partial and subjective. The squid and Cousteau's subjects are rendered vulnerable in the moments of these encounters; but the individuals imaged by Laughton appear more animated, more vital and alarming and infused with agency, than the creatures reduced to submissive props and playthings in Cousteau's film – not a silent world, but a *silenced* world made tolerant.

The squid photographs are not in the tradition of expedition photography; Hood (2023) examines its use on board the earlier 1872-1876 *HMS Challenger* expedition, concluding that the primary aim was not to produce images in the service of 'objectivity', as suggested by Daston and Galison in their analysis of photography in scientific contexts (Daston & Galison, 2007). Rather, illustrative photographs were taken aboard the *Challenger* and published to promote the expedition in its broader political and cultural context. In contrast, Laughton's squids were photographed less for narrative purposes or public consumption, rather as unknowing collaborators in photographic innovation.

Encountering their ghostly portraits in the archive was a result of many coincidences: the location of the ship, the camera, and the squid; the protocol carried out by Laughton to arrange the negatives, slides and photographs for posterity; their safe storage in the archive; the careful digitization of the album by library staff; and the choice of the archivist to display the slides on the lightbox. Indeed, in the archaeological context, Ward (2023) calls for researchers to consider the materiality of the record itself, its location, and the digitization process in interpreting archival encounters. Across

the years, choices and actions between the shutter clicking and the archivist switching on the lightbox, seeing the stark slides – an encounter with an encounter – and the squid's active role in taking the photographs afford them an impactful intimacy, with a voyeuristic edge akin to catching someone's eye in an unguarded moment. This immediacy resonates with the 'archival liveness' that Tom Schofield and co-authors strive to build into digital archives, as a design concept that makes space for dynamism and



Figure 10.

Photographs by the author taken in the archives of the National Oceanographic Centre (Southampton) in December 2021. Film reels stored in the archive cold-room.

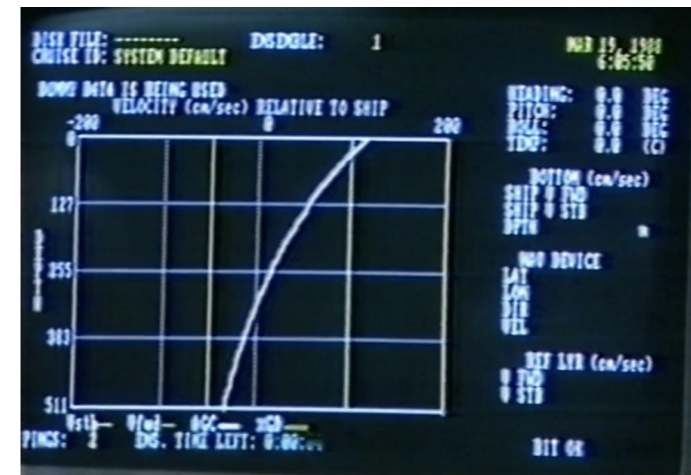
multi-temporality, and invites public engagement (Schofield et al., 2015). Laughton's squid photographs remind us that the uncanny, the unexpected and the liveness of serendipitous anarchival encounters are sharp tools in scholarly approaches to the Anthropocene, puncturing its paradoxical ask 'to hold unpredictability and planetary-scale inevitability simultaneously in mind' (Nowviskie, 2019: 4).

4. Archipelagic Archives Through Media Fragments: British Imperialism and the Ocean Sciences

The main store for the NOC's film archives is within a purpose-built cold room, accessed through a robust, insulated door. Reels of film are safely housed here, contained within metal canisters upon which adhesive labels marked with felt-tip titles suggest the contents within. Browsing the digitised collection of the public online NOC Library, you can find a one-hour video on the UK's marine research vessel, *RRS Discovery*. This 2012 compilation of informational shorts celebrates 50 years of the *RRS Discovery* II and III in action. Given the vessel's famed status we should ask: what sentiments underline this curated presentation of the *Discovery* and what is its

significance in wider contexts? In zooming outwards from this media fragment, towards a more complete picture, I look to archipelagic thinking – the allegory of the island as a fragment – as an archival methodology. Édouard Glissant, known for developing archipelagic thought in his book *Poetics of Relation* (1990), looked to his homeland of Martinique and the surrounding Caribbean archipelagos to re-frame and decolonise Western continental views. The sea instead becomes a space for relation. Influenced by contemporary

of the *RRS* fleet in Barry, South Wales from the 70's to the 90's. Given the explanatory tone and the focus on economy, the likely conclusion is that this was made for stakeholders. Stylistically, with its quick montage fades of royal flags on mast, grand cinematic soundtracks and transitions of computer graphs, the zeitgeist which followed the close of the 20th century and its promise of technical innovation is communicated. This imperial influence on environmental science and infrastructure is felt



Figures 11.1 & 11.2.

Screen-shots of computer data and flags on mast. From *Discovery 50*, a Compilation for the Event, 2012-06-28. 2928. National Oceanography Centre Online Library. University of Southampton Library, University Road, Southampton, SO17 1BJ. (<https://viewer.soton.ac.uk/records/2928>).

archipelagic archival scholarship (Furahata, 2021; Pascual, 2021; Taylor, 2020), a transnational account of ocean sciences in the UK is unravelled through these *Discovery* films. This style of archival analysis mimics the experience of encountering a seemingly 'isolated' object as an island and the associative ruminations and research that come forth in contextualisation.

The first section of the video presents Dr Leonard Skinner, then director of the Natural Environment Research Council. Skinner describes the old home

and persists today. In 2022, it was announced that NOC would receive funding from the Crown Estate as part of the 'ECOWind programme' to investigate the effect of offshore wind farms on ecological marine habitats ('NOC joins study', 2022). In England, Wales and Northern Ireland, the Crown Estate manages approximately half of the foreshore as well as land between the mean high and mean low water mark (Ritchie et al., 2022). Marine science is inevitably governed by the monarchy and it is important to re-address these ties. Indicatively, the title of Royal Research Ship (*RRS*) still holds importance and must be applied for through a warrant from the reigning monarch ('£36m contract awarded', 2004).

Figure 12.

Screen-shots of oceanographers aboard *RRS Discovery II* in the Indian Ocean 1963. From *Discovery 50*, a Compilation for the Event, 2012-06-28. 2928. National Oceanography Centre Online Library. University of Southampton Library, University Road, Southampton, SO17 1BJ. (<https://viewer.soton.ac.uk/records/2928>).

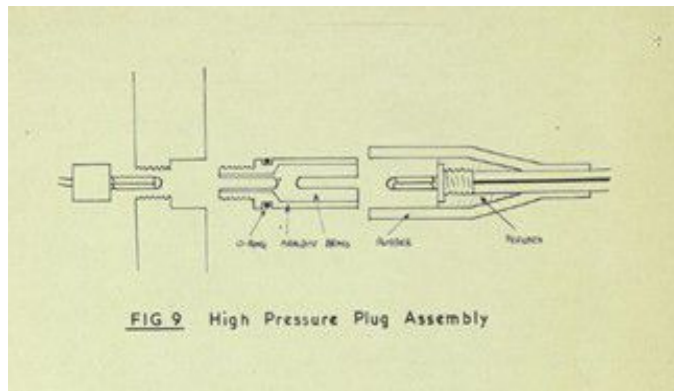


The following segment of the compilation shows the *RRS Discovery II*'s 1963 research trip to the Indian Ocean. The video contains footage from the expedition with a running, adlibbed commentary by an unnamed scientist who was on this trip. We hear him describe the process of collecting seabed samples, cores and seismic refraction surveys. The descriptions feel colloquial and relaxed, and unrepressed coughs are sounded alongside the



Figure 13.1 & 13.2

Photograph taken by author from NOC archive April 2022. Boxed underwater camera with exposure data on the top. Schematic of plug component for the Underwater camera with rubber seal. Taken from NOC digital archive - Handbook for the deep-sea underwater camera. (Design No. NIO/4781), 1958. 1175962. University of Southampton Library, University Road, Southampton, SO17 1BJ. Url: <https://viewer.soton.ac.uk/records/1175962>.



names of fellow colleagues as faces appear on-screen. Masculine comradery is evoked as we see footage of the men, topless and engaged in joint labour at sea. The site of the Indian Ocean brings with it the history of European expansion through the East India Company which operated from 1600-1874, where all-male crews similarly bonded through intense contact when sailing from Europe in pursuit of goods such as

silk and tea (Hunt, 2022). On this 1963 trip, the crew of the *Discovery* visit a small island for ornithological study. Special permission is needed to step foot on this island and the scientist's voice-over notes that natives are granted limited access to collect eggs. This insight into the control of indigenous groups unleashes thoughts related to colonial governance around the Indian Ocean. In 1963, Mauritius was held under British rule but not without tensions, causing the nation to gain independence five years later (Houbert, 1981). Colonial hold is of course, not a thing of the past and in the Indian Ocean, British sovereignty over the Chagos archipelago is still disputed (Guilfoyle, 2021).

What comes forward in this brief media analysis is the past and continued presence of imperialism and its symbolic regimes in British ocean sciences. By looking to film and media as an archival source through an archipelagic framework, we seek to grasp what is communicated on-screen to acknowledge that which has been omitted, and in this way, a decolonial and transnational approach to oceanographic archives is encouraged.

5. Light; The Inseparability of Ocean and Atmosphere

A part of Anthony Laughton's retired underwater camera has been picked out by the archivist, detached from its frame after being employed on *RRS Discovery II* to take flash images of the seafloor and creatures below. The electronics sealed in this airtight plastic cylinder, protected from high-pressure aqueous conditions, produced the images now bound to albums within the archive, transforming dark spaces into lit-up archival material of water worlds. Confined to the NOC archive, unused and untouched for years, the camera apparatus designed to systematically capture the seabed and water column (as described in Part 3) might resist another permutation and become parallel to a piece of technology used in planetary science: Voyager I, the space probe launched by NASA in 1977 with the purpose of imaging our solar system and beyond.

Underwater and astronomical exploration, inner and outer space, share similar tropes in Western scientific and visual imagination: as untouchable and inaccessible environments that 'break human technology,' dark and deep unknown spaces 'that resist a synoptic image' (Helmreich, 2023). Just as the archived camera in front of me was constructed to withstand submersion, Voyager's camera was designed to survive the harsh vacuum of space, deployed into the solar system to image Earth and reach a viewpoint on the vastness of the ocean. Having served its purpose, like Laughton's retired

underwater camera, Voyager I is now a drifting record of Earthly imagination, and the furthest man-made object from Earth (Krimigis, 2023). From beyond Neptune, Voyager produced images of the Earth as a faint orb in the sky, a lone illuminated object suspended in the darkness of space that became the

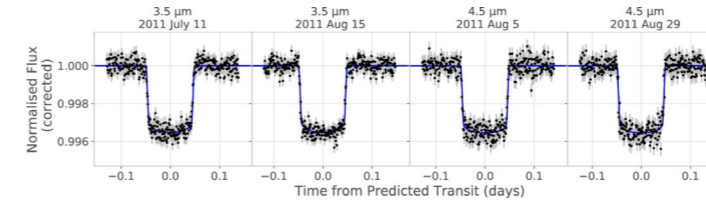


Figure 14.

Exoplanet light curves observed by Spitzer space telescope. Taken with permission of the author (Chachan, 2019).

famous 'pale blue dot' image. Laughton's camera dived beneath the ocean to capture images of the seabed and its inhabitants; similarly, Voyager shifted our environmental perspective and imagination by producing the emblematic and iconic image that sparked environmentalism movements across Western culture (Demos, 2017). For the first time, we saw the Earth on a planetary scale, where the planet, ocean and atmosphere inevitably became one. This extended perspective is now applied out beyond the solar system to explore exoplanet's oceans lightyears from Earth. Exoplanets, which are planets orbiting stars other than our sun, are unable to be imaged at high resolution. The search for exoplanetary oceans shares the same constraints of low resolution, the impossibility of a synoptic picture, and the over-reaching perspective that drives the most recent ocean exploration endeavours on Earth².

Such a planetary perspective is a prerequisite for discovering new oceanic fronts and for dealing with massive anthropogenic changes in our 'Earthly Ocean' and atmospheric system (Grevsmühl, 2016: 1). 'The Search for Pale Blue Dots' outlines methodologies and technologies attempting to archive oceanic exoplanets: '...telescopes could see the chemical imprints' (Irion, 2004), referring to signs of liquid water that can be remotely detected from telescopic observations. The method for discovering distant oceans is not dissimilar to Laughton's camera trap for squid, although conveying a completely different image of oceanic encounters. Scientists must wait for an exoplanet to pass in front of a light source (its parent star) – a moment known as 'transiting'.

During a transit, light from the star shines through the atmosphere of its exoplanet. What planetary scientists observe is a 'light curve', formed as the planet eclipsing its star causes a slight dip in that star's brightness (Chachan, 2019). Light holds

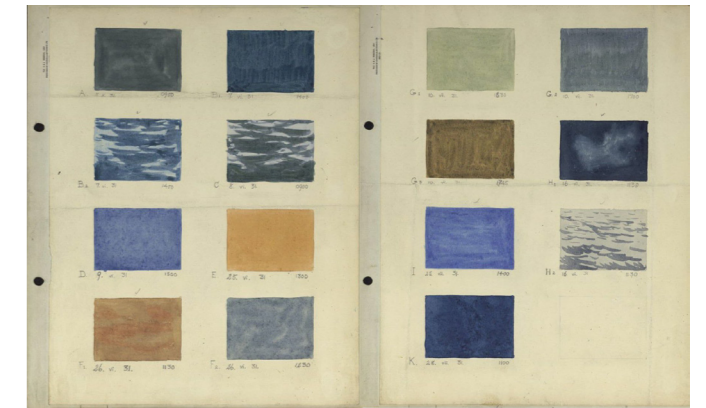


Figure 15.

Various watercolour sketches from RRS William Scoresby Sketchbook. Taken from NOC digital archive - RRS William Scoresby; Note and Sketchbook 28-77; 1930-1932. 2944. University of Southampton Library, University Road, Southampton, SO17 1BJ. Url: <https://viewer.soton.ac.uk/records/2944>.

the key to understanding an exoplanet's nature; when a light curve is observed, scientists can determine certain parts of the spectrum which are absorbed, hinting at atmospheric composition and ultimately an oceanic presence. In this way, an oceanic imprint is communicated out across the universe, with light as the vehicle. Knowledge thus becomes material transmitted from all (exo) planets, allowing for a map of oceanic worlds to be charted, an aqueous archiving process for water worlds. These chemical imprints describe the form, colour and texture of these worlds, made accessible by telescopic technology. Spectroscopic data paints planetary surfaces with oceanic presence through signature atmospheric absorption patterns indicative of water vapour. As in the depths of Earth's Ocean, light is a scarce resource for communicating material knowledge of the oceanic. Scientists are continuing to probe the darkness with a spacecraft named 'Pandora' set to be launched with the mission of cataloguing such exoplanets and building upon this interstellar oceanic archive (Quintana, 2021).

Detection of any other pale blue dots within the night's sky requires viewing oceans and atmospheres as indivisible. As for all water worlds, perception is

driven by the connection of atmosphere and ocean communicated through the medium of light. Back in the NOC archive, a sketchbook from the *RRS William Scoresby* lies atop a mound of paper. Within its dull pages lies one bursting with colour, filled with paintings of the sea surface crossed by the vessel during its expedition. Variations of colour and form between these paintings are vast, due in large part to local climate factors: not only a depiction of the sea but also a reflection of the sky. Light passing through Earth's atmospheric lens has left an impression upon the face of the ocean, translated into seascapes on these pages. Here, light and planetary atmosphere have shaped a catalogue of different aqueous spaces the same way they shape our perspectives on new water worlds. 'The atmospheric and bulk compositions of exoplanets provide important clues to their formation and evolution' (Fraine et al., 2014). That is, planetary scientists must archive and catalogue atmospheric compositions to truly imagine distant oceans. Observing these aqueous spaces through multiple atmospheric lenses is not only necessary, but also unavoidable. Light spectra travel through an exoplanet's atmosphere and across the vast vacuum of space before being catalogued by various space telescopes. Such man-made devices detect tiny variations in flux, measured in the standard unit of the lumen. Newfound oceans continue to be charted through the medium of life.

To view these foreign worlds as singular systems through an archival process born of technological constraint – that of making light travel and deliver knowledge – provides clarity on the interconnection of oceans and media: air, atmospheres, light. As with Laughton's camera illuminating the deep ocean or images sketched by researchers on the *RRS William Scoresby* painting oceanic reflections, new water worlds continue to be imagined through imperfect illumination, distorted by atmospheric and aqueous interference.

Conclusion

This article has brought forward varied ways of reading, sensing, and interpreting ocean archives by focusing on how they work to render ocean matter into knowledge and data. In doing so, we have looked to the NOC archive as a site to address the Anthropocene ocean which unfolds from multiple points of origin. This critical engagement with archival objects seeks to destabilise the organising principle of *Arkhé* and its colonial trajectories of origin-seeking that have institutionalised and rendered 'untouchable' worlds of environmental relations.

What might come forward when unravelling archival status quo into speculative collections of

matter and meaning? Or, as Jussi Parikka and Rebecca Schneider argue in *Remain* (2019: 9): 'What if archival matter does not merely mark a spot of something gone but works as its own generative force?' To cope with these questions, we have used anarchiving as a mode of speculative resistance that disrupts designated temporalities, instead encouraging mutual flows between lived environments and their records. Again, as narrated by Schneider and Parikka: 'what remain(s) is never a thing but an infinite regress of relationships, both in time and also in scattered spaces' (2019: 36). Anarchiving – as a practice-based method, comes then to transform the sedimented and familiar institutional context of the NOC into an expansive space of mnemonic and environmental relations. That is, it engages the oceanographic archive 'not as content to be received but technology to be used' (Nowviskie, 2019: 6), a place to search for design tools and invent new tropes of environmental knowledge.

The first part of this article – ungloved – attends to the archive as an experience that relies upon embedded gestures of 'common sense' and right behaviour, i.e., it excavates this performative dimension of knowledge access as one that conditions how the oceanic is apprehended (see also part three). The ungloved/bare-handed invites speculation on the ghostly mediations of matter, as does unwanted humidity that filters into the archival space regardless, making the records bloom in provocative and unexpected ways.

With these experiments, we seek to encourage speculative and transdisciplinary curatorial approaches to archiving medianatures. This means excavating how water worlds are configured through different media, such as the data stories unfolded in part 2 through the remaining bones of the whale, and that opened the shelves to the deep entanglement of archival media with earth processes. What is uncovered by bringing forth broader connections between knowing and dwelling, media and mediums for life? Part 3 recognises the fleetingness of engagements with media by looking to the intimately transient moments of underwater squid photography. These painstakingly engineered yet coincidental moments of capture retain the element of surprise, and collect social and political meaning as they are documented and filed away. Part 4's use of the archipelago as a place-based method fragments and connects media, uncovering the past and present imperial influences of oceanography. This emphasis on place-based methodologies is further expanded in our final part, which looks to the ocean and atmosphere as one. Through these ties, we can analogise our experience of writing this article – as voices at once distinguishable yet melded – urging for the recognition of interconnectedness as essential

to knowledge production.

Collaborative writing provides a fertile space for cross-contamination between different disciplines and encounters with the oceanographic archive. For example, in the permutations of the experimental underwater camera that turned – hand-to-hand – into an experiment itself, an irruptive material act that sparked different questions and genealogies connecting inner and outer water worlds to scientific images and imaginations as well as practices of light. These 'anarchival encounters' and the effort to make them speak together 'remain' important as mirrors of the epistemological struggles to approach the Anthropocene ocean.

Notes

¹Video essays were presented at the Oceans as Archives Conference (4-6 July 2022, University of Amsterdam) <https://www.oceansasarchives.org/>.

²See for instance the The Nippon Foundation-GEBCO Seabed 2030 project," a project to deliver a complete seabed map for the benefit of people and the planet" <https://seabed2030.org/>.

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