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► **To cite this version:**

Helen Pritchard, Jara Rocha, Femke Snelting. Figurations of Timely Extraction. Media Theory, 2020, Mediating Presents, 4 (2), pp.159-188. hal-03266402

HAL Id: hal-03266402

<https://hal.science/hal-03266402>

Submitted on 21 Jun 2021

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Figurations of Timely Extraction

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Vol. 4 | No. 2 | 159-188

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<http://mediatheoryjournal.org/>

Abstract

During recent years, geocomputation has become increasingly entangled with so-called 4D visualization. The contemporary infrastructure of fossil fuel extraction depends on these software tools for geological data handling, interpretation and modelling of subterranea. This paper makes use of the contaminated and contaminating practice of figuration to plot stories that highlight some of the milestones of deadly collaboration, of optimised acceleration, and of sedimented damage. It engages with three figurations of timely extraction (Consortium, Borehole and Amalgam), to tell stories that provide a way to make present the time-space complexities that emerge from the connections between extractivism, computation and semiotic-material values. The Underground Division studies those rocky figurations to expose some of their interdependent articulations such as transnational alliances, gold mining and geocomputation and how they shape life/non-life temporalities. We argue that the dynamic crossings of time and matter that Consortium, Borehole and Amalgam are embedded in establish a dynamics of repeated damage, via latent regimes which maintain extractive forces, practices and modes. We amalgamate the clock time of turbo-computing with the megaannums at the timeline of digitally mediated rocks to present agential combinations of exclusion and occlusion that each create unique modes of discrimination and privilege.

Keywords

queer feminist technoscience, extraction, geo-computation, volumetrics, time-space, figuration, creative methods, disobedient action research

“We broke the earth and now we fall through time”
(Gumbs, 2018: 139)

This paper engages with three figurations of timely extraction, Consortium, Borehole and Amalgam. It makes use of the contaminated and contaminating practice of figuration, to plot stories that highlight some of the perhaps uneventful milestones of deadly collaboration, of optimised acceleration, and of sedimented damage (Haraway, 2004: 47). But let’s start with a warning: these stories are dense. They travel through paradigms, scales of concern and fields of operation to make the time-space complexities present that emerge from connections between extractivism, computation and semiotic-material values. Specifically, the stories inquire into how timely extraction might be understood through what Rebecca Coleman calls the “temporality of the present” and in particular the making and managing of ‘the now’ (2020: 1681). This can be called an unscoping study of nowness in geocomputation, given the fact that the stories emerge from a need to write from cuts of intricacy, instead of calibrating with specific disciplinary fields.

Tracing the rocky figures of Consortium, Borehole and Amalgam, involves disclosing some of their interdependencies such as transnational alliances, gold mining and geocomputation and how they shape life/non-life temporalities. The three figures are therefore joined by many other tales and stories such as Akan gold weights, timely titans and wounded rocks. By their intertwined figuration we unfold some of the diverse temporalities and modalities along the chapter. The dynamic crossings of time and matter that they are embedded in establish a dynamics of repeated damage via latent regimes which maintain extractive forces, practices and modes. In this paper we amalgamate the clock time of turbo-computing with the megaannums that mark the timeline of rocks to present agential combinations of exclusion and occlusion, each creating unique modes of discrimination and privilege. By attending to the differentiated realities that are constituted by these ongoing, irregular and unstable intersections, we try to account for the specific complex

worldings that emerge in the contemporary industrial and techno-scientific continuum.

Consortium, Borehole and Amalgam are figures of timely extraction that allow us to inhabit, problematize, intensify and/or dismantle the operative modes of technobiomythical geontopraxis. Timely extractions are the specific crossings of the dimension of time in its diverse finite uses and measuring inventions, a fundamental physical quantity also known as “the fourth dimension”, with the Modern practices and operations taking place within the realm of extraction from the body of the Earth. “Timely” alludes to a rampant opportunism, a clear productivism ruling units of measurement and the overall observation of time as it goes. Technobiomythical geontopraxis is our combination of the notion of “geontologies” worked by Elizabeth Povinelli (Povinelli, 2016) with the sensibility shared by Sylvia Wynter of “bio” and “mythoi” (McKittrick, 2015: 23). The chapter establishes a dialogue between geontological thinking and sociogenetic theories, two critical frameworks that urge us to re-understand biopolitics at the complex nexus of volume measurement, time organization and value extraction that entangle prospecting and computing.

The specific time studies activated in this paper ask how synchronization and standardisation, repetition and memory, innovation and processing, continue to be key operations in the volumetric realm of geocomputation. Volumetric geocomputation is the term we use to describe how software and computing solve complex space-time problems for measuring and exploitation of volumes of what Yusoff calls the inhuman earth (Yusoff, 2018).

Figurations are not fictions; they are involved in presenting rather than representing (Haraway, 2018); they are hands-on devices that can activate stories of deep implicancies in techno-sciences, a term we mobilise from Denise Ferreira da Silva to describe “a primordial moment of entanglement prior to the separation of matter evolving into the planet we know” (da Silva and Neuman, 2019). Figures are ways to think with overlapping problematics such as Donna Haraway with OncoMouse

(2018: 8), Karen Barad does with the brittlestar (2014), Elaine Gan with Rice (2017) Tiffany Lethabo King with the shoal (2019: 8), Povinelli with the animist, virus and desert (2016: 14), Sylvia Wynter with MAN1, MAN2 (McKittrick, 2015: 10) and Kathryn Yusoff with rifts (2018: 104).

To attend to the entanglements at work in geocomputation, gold mining and transnational hyperstructures, we decided to think through combined figures: moving from Consortium to Consortium-Amalgam into the increased complexity of Consortium-Amalgam-Borehole. This combinatory figuring became a ‘volumetric figure tactics’, a combinatory figuring as a way to collectively think through modes of what eco feminist Ariel Salleh calls “holding together” (Salleh, 2017). We discuss holding rocks together, but also of holding together with rocks in contingent, computational worlds via the multiforming dimension of time. Volumetric figure tactics are first of all about inhabiting and situating practices and more specifically about departing from the figures of geontopower (Povinelli, 2016). As Povinelli asks in her work with the desert, the animist and the virus, we want to make sure not to cramp out the urgent critical analysis of the geo- by letting the bio- emerge without accounting for the co-presence of onto-, geo- and bio-. Equally, the key combo of the bio and the myth is something we urge to unfold on this arena, having learned from Wynter such a clarifying juncture (McKittrick, 2015).

The inquiry emerges alongside the development of Violent Amalgations, a digital 3D animation we created as The Underground Division. The Underground Division is a disobedient action-research collaboration on techniques, technologies and infrastructures of subsurface rendering and their imaginations and promises (The Underground Division, 2019). With help of many others we explore the computational rendering of subsoil explorations through volumetrics, getting busy with narrative assets for discounting time with a trans*feminist technoscience sensibility. Violent Amalgations is the eighth addition to a repository of computational rock stories, the ROCK REPO (The Underground Division, 2020b) and was developed for the on-line exhibition ¿Cómo continuar?, organised by Centro Cultural de España in Lima, Peru (The Underground Division, 2020c). The

animation brings together three 3D renderings of so-called rare earth minerals, volumetric models of precious metals and ore deposits from gold extraction. They were gleaned from gaming, geological and amateur photogrammetry contexts and are rotating in front of scrolling textual fragments. The texts are drawn from mining stories found in industry press releases, community demonstration claims, company reports, activist accounts, geochemistry surveys and historical documents. In the background, a screencast of a hesitant scrolling movement, probing a satellite image. On many levels, the on-line render of this visual and textual piece informs, illustrates, challenges and is challenged by the figurations of timely extraction that operate in this paper.



Figure 1: ROCK REPO installed in TETEM (Enschede, NL), as a contribution to BodyBuilding: A Platform in Transition, curated by Hackers & Designers. The Underground Division, 2020.

Consortium

We start our journey into the disclosure of extractive volumetrics with a figure of temporary strategic alliance, 'Consortium'. In a consortium, international companies,

transnational economic organisms, public entities and/or global industry corporations cooperate to be ready for and hold together a future: their future. Associated by contract rather than affinity, a consortium draws stakeholders together in order to plan ahead for probable outcomes in terms of environmental costs, technological culture and political economy.

Time-keeping and the imposition of timing standards has been a core practice of power. The artefacts designed and cared for by cultures along history are charged with full worldings, in the sense of actively intervening in the opportune setting of the material conditions of possibility at a particular ecology of practice. The Soviet calendar, for example, eradicated Judaeo-Christian weekends to optimize time. Or as Judy Wajcman shows in her work, Silicon Valley calendars underpinned by the assumption that all time should be colonised, harnessed and controlled, accompany users everywhere to ensure work is always present, and close at hand (2018: 15). The Zapatista calendar was introduced with a very different underlying purpose, and other figures of power are legitimized by it:

The oldest of our villages tell us that in the early days time was just like that, all messy and stumbling around like a ball on the feast of the Holy Cross. Men and women lost a lot and got lost a lot because time did not walk evenly, but sometimes it hurried and sometimes it walked slowly, crawling just like a little old reindeer, and sometimes the sun was a big skin that covered everything, and sometimes just pure water, water up, water down and water in the middle, because before it did not rain only from below but also from the sides, and sometimes even from below it rained. In other words, it was all just a relaxing moment and perhaps you could sow, hunt or fix the zacatón roof or the walls made of rod and mud.

And the gods looked and looked at everything, because these gods, who were the first ones, those who were born in the world, just kept walking and grabbing macabiles in the river and sucking cane and sometimes they also helped to shell the corn for tortillas. So everything was watched by these gods, those who gave birth to the world, the first ones. And they thought, but they did not think quickly, but they took a long

time because these gods were not very light, so they spent a long time only looking at time passing by stumbling on the earth and then they dilated because then they thought of/about themselves (EZLN Zapatista Army of National Liberation, 1999).

The figure of the Consortium approaches the monetized timing and time tracking of extraction through its ability to draw a clear line between what goes inside power crusts and what goes outside, as well as what gets done now and what is left for later, or will never be done. Whereas scholars have tended to focus on the ways in which Big Tech individualises the 24/7 present to harness and control time for optimization – the control of time through automation (c.f Wajman, 2018; Sharma, 2017; Gregg, 2017), Consortia make a different story present; the extraction of time through standards. Standards which are dependent on an enormous amount of technical resources to hold them in place. As Consortia ally for accurate timely extraction, they forge paths into the future because something is at stake. The Consortia understand what Rebecca Coleman observes; “that ‘the present’ is not separable from the past and future, but nevertheless as a distinctive temporality that requires conceptual attention” (2020: 1695). They are already-powerful agents who agree to pool their resources and synchronize their processes by setting and committing to their preferred protocols, made to their measure. In this way, they join forces to direct ‘progress’ or innovation in the direction of those who consort, routing possibilities away from those that do not. As a result, everyone outside the consortium needs to cope with the imposed standards of the consortia’s now and their temporally aligned agendas.

The specific consortium that we take up in this section is called Khronos, a partnership of hardware and software companies that are in business together to create “advanced, royalty-free acceleration standards for 3D graphics, Augmented and Virtual Reality, vision and machine learning” (Khronos Group, 2020). We encountered the Khronos Consortium while looking for an affordable, contemporary Open Standard that could hold the 3D animations in the ROCK REPO. We wanted a generally used technology that did not require obsessive training nor expensive hardware and settled for the Open Source library `three.js` that

implements the Graphics Library Transmission Format (glTF), otherwise known as the ‘jpeg of 3D’.

The glTF format is developed by Khronos as a royalty free standard for optimising and streamlining the use of 3D models by generic browser applications. The consortium grants anyone permission to use it without cost, counting on hard- and software industries to adapt it more rapidly and widely which in turn forces interoperability and standardisation through normalisation. Royalty-free is a particular intellectual property approach that strikes a fine balance between cooperation and competition, which characterizes the dynamics of many other tech-consortia such as the World Wide Web Consortium (responsible for HTML, which is a royalty free standard as well) and the Joint Photographic Experts Group (managing the JPEG format). Royalty free is neither in ideological nor in legal terms an actual Open Standard. The Khronos consortium is not obliged to share the design and distribution of 3D assets and their efforts in making documentation accessible is benevolent, which means that rights of use can be retracted at any moment. We argue that the Khronos glTF™ is specifically designed and promoted as an agreement on what time is and how it is made present by 3D rendering.

Khronos was set up in the late 90’s to develop and implement techno-ecological practices of standardisation for the production and distribution of real-time representations in three dimensions (Khronos Group, 2020). The consortium was formed to standardise multispeed volumetrics across the industrial-continuum of 3D, making it possible to share practice from medical imaging to the optimisation of precious mineral mining. One of the areas it has drawn its standards into is what we call “volumetric geocomputation”, the computational processes which include visualisation, spatial regression, statistics and space-time modelling of the geological and the geographical. In this way, the Khronos consortium has become co-responsible for how time is generated in geocomputation. Or to put it differently: the semiotic materialities of volu- and chrono-/khrono-metrics are settled by a very specific transnational technoscientific consortium named Khronos.

The time of the world and in particular the time of the underground has become inseparable from volumetric calculation, due to the committed attunement to the set of standards like glTF, which lay at the core of the techniques, technologies, infrastructures and protocols used for high-tech measuring and extracting projects. The infrastructures that enable the simultaneous quantification of volume and of time could use some disclosure if we want to call into question their operations. What are the specific organising forces at work that structure the production and mobilisation of this worlding regime and the melding of metrics? In these infrastructures, uneasy alliances of perverse synchronicity and timely opportunism grow and expand socio-technically; fiercely protective by being in company, but how do they function? How might they be disrupted, intervened upon, transformed in the key spots where other non-standard worldings might emerge?

On their website, The Khronos consortium promises that its shared standards will enable products and resources to be “experienced realistically and consistently across all platforms and devices, such as mobile, Web and Augmented Reality (AR) or Virtual Reality (VR) solutions” (Khronos Group, 2019). But the commitment to optimised, linear time had already started before, with its very naming, the non-arbitrary and non-innocent mobilisation of the Greek mythological titan Κρόνος, Chronos or Cronus. As the king of heaven, Khronos was associated with linear and destructive time. As a deity, he personified time and temporality with two other titans, Aion, and Kairos. In one version of the myth Khronos was considered to have the shape of a three-headed serpent. The heads were those of a man, a bull and a lion. Along with his daughter Ananke, the goddess of inevitability who also appeared in the form of a snake, Khronos revolved around the primordial world egg, until they split it apart to form the earth, the sea and the sky. According to the Orphic cult, he gave birth to Aether and Chaos, and created a silver egg in Aether. The deities Phanes and Hydrus were hatched from the egg, and later gave birth to the first gods and the universe. There are many variations of the myth, however most recount worldbuilding through “chronological, sequential, linear time – that devours and consumes” (McCulloh, 2014: 55). Chronological, sequential time that devours

and consumes... it is a form of time that sounds all too familiar, due to the euro- and andro-centric process of naturalisation that it imposed in the places we are writing from and the digital tools we are writing with. Just like the mythical story of Khronos, these computational processes are worldbuilding as they shape modes of spatialisation, measurement, standardisation and optimisation of bodies, devices, environments and global systems.

Under the motto “Connecting software to silicon”, Khronos organises almost choreographic alliances between hardware and software companies through agreements of telos. This tying together of matter and time is crucial for understanding how consortia as a figure inhabit the capitalist regime of technobiomythical geontopraxis. The Khronos consortium currently consists of 150 self-appointed transnational Big Tech hardware and software companies, academic institutions, public services and institutional structures. They represent the most economically powerful and largest technology companies globally including Google, Apple, EPIC games, Intel and Nvidia. As a member of this developmentalist and innovation-oriented mediatic echo chamber, these companies “contribute to the development of Khronos specifications, and vote at various stages before public deployment and are able to accelerate the delivery of their cutting-edge accelerated platforms and applications through early access to specification drafts and conformance tests” (Khronos Group, 2020b). Other actors (not part of the consortium) are invited to use published versions of the standard, but do not have access to the most accelerated formats. The control over this ‘early access’ constitutes the monopoly position of Khronos, as reigning timekeeper in most 3D worldings. It imposes extractive temporality and linear time at the heart of the consortium, a logic in which members will always be ahead in technological development.

Making standards concrete through controlling the flow of processes through time and matter is a characteristic of the extractivism at work in volumetric regimes, and in that sense, Khronos can be called “a stakeholder of the techno-colonial regime” (Ye et al., 2020). This is because extractivist volumetrics are not tied to specific

locations or even resources, but are designed to jump through time and space by the smoothening standardisation of both. Of course, “Through their control over resource-combination and resource-use, extractivist systems are able to generate a huge value flow towards the operational centre” (Ye et al., 2020: 160).

The distribution of power through the delimiting of insides and outsides, nows and later, do’s and don’ts, accountability and degrees of dissent around 3D and 4D computing is far from neutral, and we argue that the enforcement of linear time on the world is where violence resides. The Khronos consortium demonstrates how volumetric violence takes place when the 3D polygonization of the world happens behind closed, expensive and complicit doors. We call this Khronometric/Khronologic violence – the imposing of linear time metrics over inhuman complexities and interoperabilities. It is important here to note that we are not reasserting computational time as linear, but want to tune to the ways in which the standards hold together progress with metrics to present time as linear through computational processes.

Khronometric/Khronologic violence operates like stasis in narrative structures. It is the benchmark that must be met before a voice can even have an audience (Boje and Henderson, 2014: 56); it counts the rhythms, sets the limits, delimits moments and establishes beginnings as well as ends. glTF standardizes a very specific material constellation through the mechanisms of modern time-keeping. Its industrial consortia execute protocols as a way to enforce the continued standardisation of time through regulating the live computational arrangement of polygonal elements in a 3D object or rendering speed. The Khronos glTF™ format demonstrates how standardisation is not ‘just’ an agreement on a technical format but a platform for shared corporate power that forces others to conform and participate in specific worldbuilding. Standardisation technically rigidifies relationalities. This writing-in of standard time and space into the 3D format of glTF means that it becomes difficult to propose other worldings outside of the consortium – the time of the world becomes made and controlled by the time of computation and economic calculation.

What if time(s) could be grabbed back? Simultaneity, recursion and ongoingness of damage along and through time is what needs to be accounted for in order to interrupt the smooth continuation of technocolonial capitalist exploitation and contemporary totalitarian innovation. How to widen timetracks to do both a theory and a praxis of non-developmental, non-fungible co-habiting? How to not let go of tracking damaging timestamps while switching the focus to other space-time matterings? We need to ask what anti-colonial chronologies or chronotopies might be extracted from the problematisation of depoliticized linearity and certain alignments of policies.

The measuring and arranging of time does not necessitate straightness and for-profit alliance, it could also unfold from the situated stumbling messiness of an alloyance (alliance + alloy). If we want to think about time-space otherwise, we need to invent ways to challenge their consorting amalgams. Alloyance might be a mode for not-incompatible aides to cut the oppressive dynamics of hand-holding (Indigenous Action Media, 2014). A means of holding together without blending into the background or emerging as a clearcut alliance.

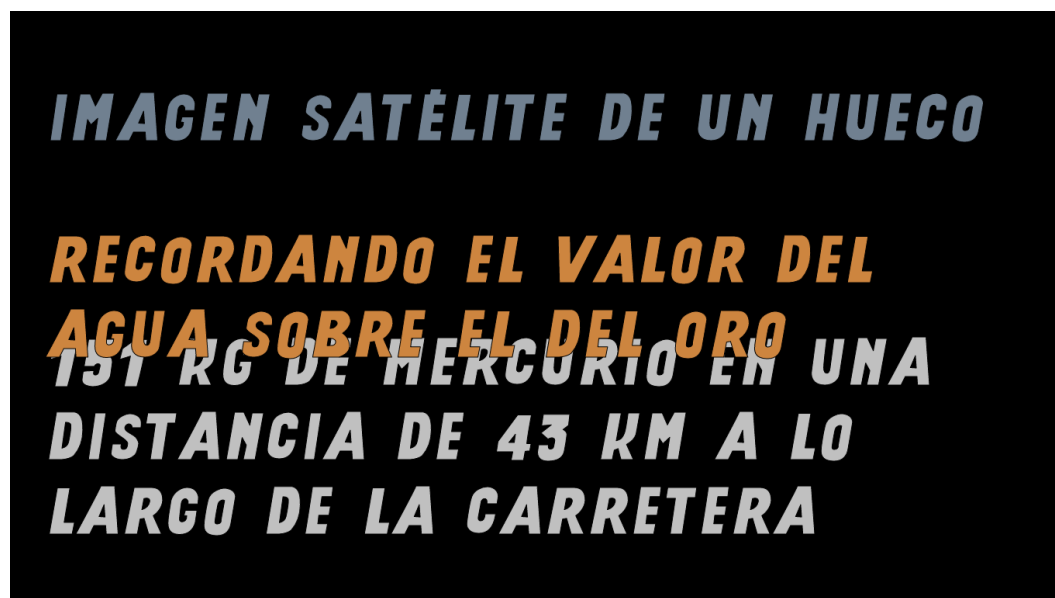


Figure 2: Violent Amalgamations, text animation layer. The Underground Division, 2020

Consortium-Amalgam

The second figure of timely extraction and the first figure-combination we want to introduce, is Consortium-Amalgam. In this particular arrangement, Amalgam refers to amalgamation, a process of change which happens due to different materials being brought in contact with each other, a transformative blending that changes each agent involved. The amalgam is a figure that crosses between alchemy, contemporary chemistry and mineralogy. It is also commonly used to name ‘any’ mixture, any blend: it is a specific worlding that emerges from the mollifying operation of some materials onto others. Its etymology refers to ‘malassein’ or ‘malakos’, “to soften,” and more precisely to the softening effect achieved by applying a warm ointment on a cut; the substance might soften pain, or soften flesh, or both at the same time. Chemically speaking, the amalgam appears as a mercurial melting; a mixing of metals, and the extraction of gold from ores.

By bringing two figures together, we want to test how the praxis of figuration could work without separating figures from their background. As a techno-political cut, Consortium-Amalgam proposes a particular mixing of elements: situated gatherings, heterogeneous togetherness, semiotic-material co-constitution, specific gatherings and differentiated stuff. It turns our attention from the meta operations of alliance to the intricate micro-politics of the mercurial materials that bind them molecularly. In her work on protein modelling, Natasha Myers suggests attending to the molecular might open up a kind of ‘molecular intuition’ which opens up to possibilities for life at the moment of molecule binding (Myers, 2015). Indeed, research on molecular modelling reminds us of the fact that bindings are never permanent, and also that they were not already there. For instance, in the process of alloying gold from mined ore, both the formation of more-or-less stable materialities and their dissolution, produces toxic waste as well as somewhat pure substances.

Historically precious metals have been used repeatedly to tell and impose telluric stories of value from the mythical El Dorado’s golden aura to the Akan Gold weights (c.f Aston, 2018). As Yusoff shows, gold shapes the material history and temporality of value significantly: “Slave capture and ownership were initially

instigated to mine for gold in the New World. Both enslaved, land and ecologies became subject to encoding as inhuman property, as a tactic of empire and European world building” (2018: 68). Whether tactics of empire or cohabiting with the figurative imagery of temporal bonds of ancestors and the earth (the memory only carried by rocks), or acting as standard units of measurement for trading gold; the telluric stories of value told through gold are the material histories of volumetric time-space.

El Dorado and the Akan Gold weights share an important but often overlooked quality. They are both mediations of the measured amalgamation of volume, value and time that set the mythical conditions for volumetric regimes in contemporary precious mineral extraction as they melt chrono- and volu-metrics together. This amalgamation of objectified time, measurement and volume through myth is the conflation of what Barbara Hernstein Smith referred to as the ‘double-discourse of value’, in which on “the one hand there is the discourse of economic theory: money, commerce, technology” and the other hand the “discourse of aesthetic axiology: culture, art, genius, creation and appreciation” (Smith, 1988: 127). In the melding of chrono- and volu-metrics these contingent material-discourses of money, commerce, technology and cultural myth become amalgamated, and the Marxist separation of aesthetic-use value and exchange-value is collapsed. And as in Smith, the work of valuing (much like in the Consortium) takes place through communal agreements and standards.

Computation has configured the cultural expectation for information as continuous, standardised and increasing in equivalence. Geocomputation in particular combines volume as a resource with ‘objective time’ or rather Enlightenment’s secular time: Modern time, scientific time, measurable and infinitely calculable time – all the way to the high-speed time of hyper-computational turbo-capitalist operations and benign tales of ‘renewable’ energy which tags certain practices of extraction as ‘sustainable’. Gold has become an indispensable resource for making Modern time in digital devices. It counts as the most stable metal, it is resistant to corrosion and is best at keeping computational time in its use in connectors and transistors. For Big

Tech, this means time is money, time is gold: calculable time abstracts the relation between gold and time as equivalent for exchange-value. Again and again, time becomes material through gold; time both figures and is figured by gold.

In technoscientific stories of gold mining or fossil fuel extraction, the Consortium-Amalgam inhabits a volumetric regime that organises the time-space-matter of geo-computing techniques. Gold trade values travel at light speed through fibre optics, automated calculation powers ‘mine initiation’ to prospect and precisely predict volumes of gold ore to be liberated, gold doping speeds up binary computing, wicked profits are made in so-called Urban Mining where cheap broken phones are re-imported from extraction sites so that its gold components can be reclaimed once more by Umicore, and calculable time is being kept constant in computers and smart phones through the use of electrical conductors – yet again – made of gold (UNCTAD, 2020: 16). Could this continuous loop be the ‘golden double-bond’ of the Amalgam-Consortium?

Whereas much post-anthropocentric thinking on time has attended to how non-human and inhuman temporalities are entangled with human time in conflicting ways (Rossini and Toggweiler, 2018), the Amalgam-Consortium tunes us to amalgamated figures that rely on inhuman temporalities and capacities for temporal arrangements and that make extraction possible through computation and at the expense of local, indigenous lives. And it is these figures that have historically and temporally generated regimes of technological, biological, geological, ideological and mythical praxis – regimes that are not often in isolation, yet combined in deep complexity and, we argue, amalgamation.

The digital animation *Violent Amalgamations* emerged from observing the layering of temporal arrangements and differently calibrated measurements at work in and around the Conga mine in Cajamarca, Peru. Subjects, direct objects, indirect objects and actions move vertically across the screen, overlapping with different speeds. Depending on the graphic processor of the rendering device, they visibly tremble or appear to run smoothly, without latency.

67 trucks waiting for the mine to re-open, finely crushed ore, countless communities of endoliths, a smartphone ringing without end, the importance of saying that it is “over”. How many litres of water will the ancestors drink?, silence and denial, the present tense of the verb “to dig”, 0.1 gram of cyanide killing, one human and countless deep-time bacteria, the important moment when she said it is “over”. Three grams of cyanide diluted in 3 cubic meters of water per ton of rock, a physical separation between cause and effect, the usefulness/price of atomic stability, the importance of saying that it is “over”. To reduce the time between the push and get, colonizing fissures and cracks in the rock, the freezing of a zone, the erasure of many, importantly saying that it is “over” (The Underground Division, 2020c).

Violent Amalgamations is part of a series of audiovisual works gathered in the ROCK REPO. They operate with the deep implicancies of moving between figure and ground, asking what happens as a result of cutting and cleaving, and what other formations could appear. A great deal of “stony patience” (Yusoff, 2018) is required to resist and repair the damages from the various practices of separation which bring ore and its energies to the surface of the earth. Sharpened by queer and anti-colonial sensibilities, the ROCK REPO investigates the way undergrounds are quarried, measured, quantified, historicized, visualized, circulated, predicted, classified, extracted, remembered and modelled. It is an environment for studying volumetric imaginings, the softwares and hardwares that ROCKS intervene on and for building new glossaries on the go. These studies recognise that ROCKS have their own lively forces and relationalities, and operate as a chipping away at what limits the collective resistance and reparative capacities of and with ROCKS (The Underground Division, 2020b).

While the historical present of geocomputation relies on Enlightenment’s stable and continuous time, it also holds a peculiar position as it actively generates the ‘end of time’ through the modelling of melting volumes of ice, carbon and methane and other figures of climate crisis and the Anthropocene. The techno- and geological material-discourse of extraction depends on and produces colonial temporalities of progress and improvement. What Jennifer Gabrys describes as the critical relation

between progress, temporality and materiality (2011: 106). This unstable but continuous alliance of totalitarian innovation, automated geocomputation, glossy data, spinning earth, clean textures, high speeds, gold conductors and 5G networked non-humans seeks to replace the inhuman temporalities of ‘traditional’ imperial devastation, settler exploitation and commercial routes. Mechanical and human scale figures of gold mining such as the open pit, the toiling body, the Northern prospector, *el código del virreinato*, establish themselves again and again as progressive values and scientific objective temporalities that contrast with the fleshy, subjective and unruly temporalities of the local protestors. Deaths caused by landslides, pollution and lack of water, crushing landscapes and rocks is the material price to pay for the continuation of both extraction and of the too-well known developmentalist timeline of progress.

Contemporary extraction relies heavily on normative temporal modalities that themselves depend upon individualized and stable bodies. The continuum of geology and extraction is amalgamated with consortia of transnational industries, militarized nation-states and Big Tech. Their shared interest is to construct objective time as an extractive temporality against the backdrop of contemporary Indigenous time, and the ancestral protests it carries along. Reducing the possibilities for considering their times as being present or latent instead of past and absent, these consortia are in business to engineer systems for global time versus local time, time as resource versus grounded time.

Both Consortium and Amalgam tend to figure productively arranged whens, how-oftens and for-how-longs. Both figures count confidently on timely projections, setting futures in motion and owning time’s trajectories which produce certain irreversibility and exclude other possibilities. We propose a counter-reading of the combinatory potential of amalgam-consortium, to invite active considerations of simultaneous material-semiotic arrangements, persistence of damage, partial reparations and non-standard coincidences. Attending to the other temporalities of the Amalgam-Consortium is an attempt to reclaim non-linear processes through a coming together otherwise, away from opportunistically synchronized progressive

timeframes. Amalgams and Consortia might also be and are being rethought as a space of alterity and possibilities: “animated by hope and desire, belief materialized in deeds, deeds which crystallize our actualities. And the maps of spring always have to be redrawn again, in undared forms” (Wynter, 1995).



Figure 3: Violent Amalgamations, text animation layer plus models: Magnesium (Author: philou972), Chrome (Author: philou972), Gold Nuggets (Author: quedlin). The Underground Division, 2020

Consortium-Amalgam-Borehole

In this section, the Consortium-Amalgam conjoins with the Borehole to form an even more complex space-time-matter joint. Through their different volumetrics and transformative materialities, the Consortium-Amalgam-Borehole figures unstable grounds for timely extraction of the present – a present which, as Coleman describes, is folded into the past and future (2020: 1695).

The Borehole is a deep, physical wound but also a wormhole, and hence a specific kind of shortcut for understanding damage. A borehole is by definition a persistent passage which is always just wide enough to make extraction flow easily, again and again. Boreholes are drilled down or sideways, sometimes at great depth, to penetrate gravel, bedrock or aquifers. The downwards and circular movement of the drill

forces openings in matter formations, turning them into always-available resource or storage.

In the company of the straight damage-on-the-spot of the Borehole, the Amalgam has a different relation to extraction. Volatile mercury is put to use again and again to attract specific metallic particles, separating them from the background of their carrier rocks. For now, they form a stable golden bond of solid, paste-like, fluid, spongy, hard or soft material. The amalgam is there as an in-between stage, as a step in a process towards evaporation and separation, from slug to nugget. The Borehole implies quite a different gesture of flow management, a physical driving vertically into the ground that produces access for some, and depletion for others.

The timely operation of the Borehole imposes a never-ending feeling backwards (Love, 2009), through the many layers of the earth, drilling deep down to make repetitive upward movements possible: energy, resources, fluids end up in the dirty and rough hands of already-powerful agents. And this is how we know that the Consortium was already prepared. That potential profit and possible extraction had been scoped. That locations were targeted and conditions were negotiated beforehand. The Consortium arrived but did not situate itself; it is there to manage the taking but not there to hold. With the Consortium-Amalgamate-Borehole setting the scene, we can now return to 'Conga'.

*Now we are in Cajamarca. We are *also* in a web browser, rendering a 3D amalgam over a Google map's street view; satellite tiles, images appear of a past moment, are stitched together as we move. This is the temporality of capitalist turbo-computation. A representation of a region of Cajamarca is being rendered in a web-browser. Satellite view. Meaning: cenital. A cenital representation of a wound is now being rendered on a smooth surface. And now. Hypercomputation, it's called. For how long. Rock-like textures overlay on compressed polygonal geometries over Cajamarca. Seamlessly rotating, triangulating. Sometimes these generated textures dissolve, like impossible mineralised shatterings, as they move outside of the designated viewpoint. Conga is located within Cajamarca. Cajamarca is located in the North part of the*

Peruvian country and shares a border with Ecuador (the seam of the nation state this time, not so much the dividing axis of the equator). It is located at heights reaching 2,700 metres (8,900 ft) above sea level in the Andes Mountain Range, the longest mountain range in the world. Part of its territory includes the Amazon Rainforest, in total the largest on Earth. Take those as the wound's modern coordinates. This wound fills the screen with solid rendered black, any timely movement flattened in the image until refreshed. The movement is as smooth as a fiction repeated too many times. Right now we are mousing over a Google map. This is not Conga, this is a very specific representational take of it. Cartography-is-not-reality. But still, it shows a damage. And the damage is for real. Looking down from the satellite view we spot the wound at the Conga Mine site.

The wound has particular characteristics, it is black, with steeped edges. Or the wound is blue, with artificial terraces. Or grey, with digging areas. Or brown, with track parking slots. This particular logistic wound is called the Minera Yanacocha. Minera Yanacocha is also the name of the a company mainly owned by Newmont Mining Corporation and Buenaventura, a Peruvian mining company, and the International Finance Corporation, the private-lending arm of the World Bank.

Mousing over to the nearby Las Bambas mine we now see below us telecoms construction work at the open pit mine; a borehole. In a site right in front of us we see that Espoo, Finland-Nokia and Telefónica Peru have signed a contract with Minera Las Bambas, the ninth largest copper mine in the world, to enable digitization and automation projects at its site in Apurimac, Peru. Nokia provides a private LTE network for the mine 4,600 meters above sea level; a high-capacity, low-latency and multi-services network that enables connectivity for several thousands of workers, mine devices and applications. Las Bambas is owned by the Minerals and Metals Group, whose major shareholder is China Minmetals Corporation (CMC), a Chinese state-owned enterprise. MMG acquired Las Bambas copper project from British Glencore Xstrata plc. for US\$5.85 billion. Back at Conga, there is a different latency.

Drilling, drying, adulterating and washing away: the story of Conga is a story of damage, led by a transnational consortium with the aim to continue extracting amalgamating ores for profit. The extent of the damage occurs because of the alloyed temporalities of the Consortium-Amalgam-Borehole. Across the Conga site hundreds of boreholes drilled during decades of exploration activities remain inadequately plugged or abandoned (Fernández-Rubio, García and Carvalho, 2015). These boreholes are the material wounds of stakeholders scanning for gold. Many interested parties emerged around the wound of the Conga mine, including mobile network providers, smartphone manufacturers, microchip industries, state officials, water companies, transport companies, international investors. As we observe the extraction of gold in the Conga mine, we see consortia emerging with the Borehole as processes of amalgamations take place. The intersecting layerings of time and extraction that hold this story together are also what keep on breaking the earth: the explicit and implicit pre-planning consortia that agree to share profits, but not the damages visible in the wound. On the one hand, Consortium, Amalgam and Borehole have their timely imposition and hence multiplication of damage in common. On the other hand, their repetitive modes show the recursive temporality of exploitation without end. Now we fall through time.

In the years that led up to the closure of the Conga Mine, local protestors lined the streets chanting: “¡Agua sí! ¡Oro no! ¡Agua sí! ¡Oro no!” (Water yes! Gold no!), exposing the communities’ urgencies as they equalled Conga with death (Bernard and Cupolo, 2012). Thousands of residents of Cajamarca gathered at the Laguna Azul, one of many high-altitude lakes on the Conga Mine site, in an effort to protect their water resources from exploitation and contamination. Ana Bueno Abanto, director of La Casa de las Lagunas, clenched a handful of soil and asked the audience to remember the violence. “Rifles have been used against people that have tried to defend this land that I hold here in my hand,” she said. “This land, our land, was disrespected on that day of violence and no matter how many metals and precious minerals are beneath this land, we as a community will always protect it and make sure it is respected” (ibid). Protesters walked to shores of Laguna Azul, cupped the

water in their hands, and drank it down. Speakers rallied up the crowd, vowing for a long fight to protect their land and water from another gold mining operation, and then, finally, the protest ended as it had begun, with the singing of the Tinkari band's, "¡Agua sí! ¡Oro no!".

Since the Conga mine closed in response to fierce local protests, its *nowness* and in particular its 'liveness' is made present through endless delays and blurry waiting for the exploitation to actually end. There are different latencies involved in these processes, such as the continued pollution seeping slowly into the neighbouring areas; or the exploitation regimes themselves, that have not ceased to exist with the closing of this particular mine. Currently, they are neither active nor absent in this wound, but somehow "frozen" and waiting confidently for the moment sooner or later that conditions will change, and extraction can be resumed. In Bakhtin's chronotopes, one of the tropes is the 'threshold': a spacetime of quiet evaluation, measuring forces and making both a revision of what happened and a plot for what is yet to come (Bakhtin, 2002). In understanding the Conga mine through the combined figure of Consortium-Amalgamate-Borehole, it becomes possible to see how colonial temporality is not just active but also latent, held at thresholds of power. The infrastructure still remains ready to leap back into action, a passive-aggressive waiting to be made active again by any violent means. At the Conga mine, volumetric time-space lays latent, the protestors are no longer on the streets and machinery is halted at the mine, however trucks are still circling the wound, cyanide leaks from unplugged boreholes and for years to come, metals will be present in strands of hair and breast milk. There are many latent pathways for the migration of contaminants into local Conga waters: permeability of the rock due to fractures and faults; increased fracturing due to mine blasting; open and leaking blastholes; high permeability in the nearby sediments; long-term degradation of tailings and other mine structures; and seismic activity.

Latency, vibration, pulse: the most basic signal of what is generally considered to be 'alive' (v. inert) or life v. non-life. However as Povinelli notes, the formula "Life (Life{birth, growth, reproduction}v. Death) v. Nonlife" is now unravelling

(Povinelli, 2016: 9). The complexity of the Consortium-Amalgam-Borehole produces a powerful impression of the ability to freeze life and non-life, and that ‘nowness’ is not tied to a separation of life or non-life. The intricate interplay between fullness and emptiness produces an unliveable lapse of violent quietness. While the eroding of forces and matter makes it work across time, it seems to reduce the potential levels to fight, react or re-invent to the bare minimum.



Figure 4: Violent Amalgamations, text animation, models and background. Carretera a Conga ©2020 CNES / Airbus Maxar Technologies ©2020 / Google Maps. The Underground Division, 2020

No water, no life – no gold, no time

Working our way down and up from the Consortium, through the Consortium-Borehole and into the Consortium-Amalgam-Borehole, discloses that the mattering of time-space and in particular the “extractable now” will always be a violent amalgamation as long as it is figured within patriarcho-colonial capitalism and its continuous unfolding of hyper productive, timely extractions.

In this chapter we have attempted to think with volumetrics and the time-space telling of stories of volumetric geocomputation and its grounded calculations, generating new figures for unfolding their complexities. As we learned from feminist

techno-sciences, by committing to a presentational attitude, figures have the potential to not operate towards representational tricks. As Elane Gan notes “[t]here is no matter without relations; no relations without durations; no durations without difference” (Gan, 2017: 88). So, we present complexity in ways that keep with matter, space and time, understanding that volumetric thinking and praxis is in urgent need of different figures, but also that figuration might need to operate differently itself.

What volumetric practices might make time and space present in other ways, to tell the stories of damages inflicted through the Amalgam-Consortium-Borehole, *without further appropriating or extracting*? Each of the elements in the figure-combination Consortium-Amalgam-Borehole offers its own handles on how to draw the maps of timely extraction differently. The Borehole can also be a passage, a shortcut for understanding damage. It is also a wormhole, a portal for drilling down the chronotope of the threshold. The Consortium as transnational alliance does not have to be organised to rule the earth, but can be thought of as a promiscuous practice of organising accomplice for transformation, maybe. The Amalgamate is a way to say entanglement with implicancy and might offer a view on what response-ability (Haraway, 2008: 88; Barad, 2012: 208) with materiality might look like.

The Consortium-Amalgam-Borehole is presented as a set of interdependent tools to be taken up to tell different stories of the mediations of time-space in computational practices. To engage with Consortium-Amalgam-Borehole means to present the complexity of volumetric-geocomputation from the Khronos consortium to the Conga mine, from the boardrooms to the boreholes. Consortium-Amalgam-Borehole discloses the relationalities that make possible telluric mediations and computational practices for volumetrics and the relationalities that are made possible. As practitioners, artists, thinkers, designers we might ask how to intervene on these figures of capitalism and what types of activism can address the “extractable now” of the Consortium-Amalgam-Borehole? How to do this in ways which do not repeat the flip into normative modes of repair and reparation, which often perpetuate the violences of timely extraction by keeping the basis of the regime untouched and not accounting for the complexities of the time-space, and their transformative potential.

Instead we might open up boreholes into other time-spaces that are already there, actively piercing the most deadly crusts of the technocolonial apparatus. As Tiffany Lethabo King suggests, through errant and out-of-sync time and space coordinates we might “disrupt the movement of modern thought, time, and space to enable something else to form, coalesce, and emerge” (King, 2019 :11).

What are the potentials of the Consortium-Amalgam-Borehole as a technocultural figuration? How does it recall a sense of and for complexity, a rejection of flatness and flattening, for joy of awkward co-constitution? What it would mean to be in consortia with others, to consort with others differently ‘holding together’? We present complexity from a position of love for alliances and gatherings, as a collective attempt to resist making new boreholes of coloniality, invasiveness and appropriation that is present in telling telluric stories of the global souths. It is through these practices of speculation that imagination becomes folded into our analysis of volumetric time-space, as an attempt to resist overly rational, linear and knowable time-space patterning. As Katherine McKittrick writes, calling on Octavia Butler: “our engagement with place, and three-dimensionality, can inspire a different spatial story, one that is unresolved but also caught up in the flexible, sometimes disturbing, demands of geography” (McKittrick, 2006: 2). So...we might consider how three-dimensionality might also inspire a different and unresolved telluric story.

If you have made it this far, you must have noticed that it is not easy to write of the timespaces that amalgamate through the Consortium-Amalgamate-Borehole because it stretches simultaneously across paradigms, scales of concern and fields of operation. This text and the practice of the Underground Division is an unscoping study, in which clarity is out of reach and the task of writing seems almost impossible within our current scholarly and artistic context. However, making the complexity through which time-space emerges present via specific stories demonstrates the power relations that operate on and are made operative by volumetrics: always and again technically conflating the dimensions of time and space. Through these figures, their tales and material histories, we study the production of time-space within volumetric geocomputation and the ways it enforces how long something takes, the

keeping track of things, the violence that depends on who keeps the time and how time is kept.

We end by returning to the ROCK REPO, our own device for studying the temporalities of volumetric-geocomputation (The Underground Division, 2020b). Placed next to other amalgamates in the ROCK REPO, currently eight clusterings of digital objects bring together elements that are gleaned from different worlds. The Amalgams mix and merge models, backgrounds and animated texts, accentuating and sometimes blurring their diverse materialities, making their differences collide, blend and contrast with each other. While warm mercury is poured onto minerals, softening and dissolving the hardened ROCKS into softened gloopy and viscose liquid form, computation hits the mineral. The ROCK REPO asks: what dissolves? When the minerals of hardware mix with geometries, what amalgamates? Amalgam number one for example, which is called 'Attractions'. "Oil spills erupt inside a 3D particle of rock, rendered in purple rejection, and text connectors juxtapose polarized terms on magnetic forces, in two moving planes" (The Underground Division, 2020a). Or: a 3D-object cuts open sharply when hitting a virtual horizon, a sharp-lined window reveals for some time a pixelated recording of an uncontrolled oil spill, sending particles upwards and sideways. The hole opens and closes, but text keeps scrolling sideways: "IF SO – WHAT IF – KIND OF – AS LONG AS", slowly disintegrating sentences and re-compositing phrases (ibid). Or: a text circulates on an endless forward manner along a horizontal set of lines, sometimes occluded by one drop of modelled lava, and then another, and then another... while in the background the spilling force is reproduced in its peak and played all over again. No water, no life – no gold, no time.

As an opportune study on the latent forces of contemporary industrial, colonial, commercial, settler, extractivist capitalism, the figure of the Consortium-Amalgamate-Borehole became a device for recognising and accounting timely extraction differently. While time and time-space made by volumetric geocomputation is usually deadly, it also might have a generative side that provides openings for otherwise. It becomes a way to describe the digital gatherings that

together attempt to address what is going on in volumetric-geocomputation: As chemical solvents, substances of a different cultural order, are merged together and presented to punctually convoke attention to a specific aspect of volumetric-geocomputation, extractable time and its implicancies.

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The Underground Division is a disobedient action research collective on techniques, technologies and infrastructures of subsurface rendering and their imaginations/fantasies/promises. It is dug by Helen Pritchard, Jara Rocha, Femke Snelting with the help of many other others. Which are the presences, latencies, absences and potentials that need to be accounted for, in relation to that deep and thick complexity? The Underground Division bugs contemporary regimes of volumetrics that are applied to extractivist, computationalist and geologic damages. It is an ongoing hands-on situation for device making, tool problematizing and "holing in gaug". <http://ddivision.xyz/>

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