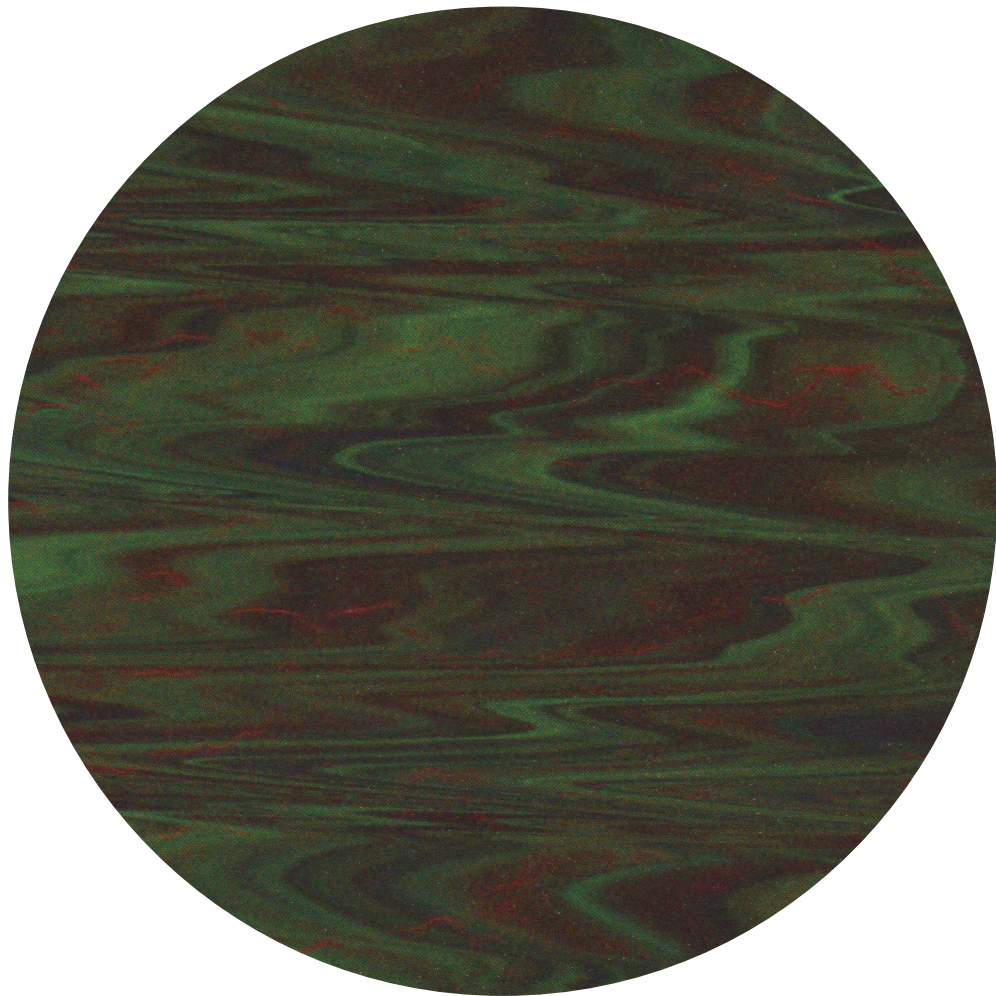
A circular piece of textured, light brown paper. A wavy line, possibly a tear or a design element, runs horizontally across the middle. Above the line, there are several small, scattered dots in various colors (green, blue, red, black).

FLUX UNTIL SUNRISE

Geraldine Juárez  
+ rojal



What does it mean to work with ice, bubbles, glass and glazes in a world that is melting? And what is the relation between these materials beyond their phantasmagoria? At some point they are all liquid and crystal, they flow, they melt, crystallize, they pop, they produce colour and light phenomena, they also break.

This book is a document about the production process of functional screen-glazes for ceramics, one that took shape through ideas that not only inspired me, but helped me gain a better understanding of that process. These ideas, which I understood as materialism *mágico* (magic materialism), are discussed in an interview with Professor Esther Leslie, whose words and thinking has been at the core of my recent work with crystal-like materials.

The screen-glaze recipes use waste from iPhones and LCD screens as a glass former component. They are called LCD Glaze and Gorilla Glaze. I chose to work with the form of ceramic plates, considering transferware techniques and ornamental dishware (such as china plates), its materials, narratives and processes, as part of the long history of the screen, which includes the electronic display and its magical liquid crystals. These screen-glazes are the chemical synthesis of specific types of relations between energy, materials, work, labour, processes and machines, accumulated throughout our non-linear history.

Looking at the history of surfaces, the circulation of images, the technological obsolescence and its waste in times of economic and ecological crisis (which are a different side of the same coin), I found in the broken pieces of our screens a chemical proxy to connect with the surface of the liquid crystal epoch.



## **MATERIALISMO MÁGICO: FROM CREAMWARE TO SCREENWARE FROM EARTHENWARE TO SOFTWARE**

AN INTERVIEW WITH ESTHER LESLIE

The liquid crystal display is the most dominant crystallization of contemporary commodity culture, of the way we consume, communicate, work and relate to others. LCD screens dazzle like the sun and are as ubiquitous as the clouds. Screens are relations between things; they are 'matter that enable the movement of other matter', to borrow the words of Brian Larkin.

Influenced by Marx, Lewis Mumford, in *Technics and Civilization*, historicised how objects and cultural 'technics' are always the result of non-linear historical conditions that accumulate at a certain point in history, resulting in the dominance of specific types of relations between energy, materials, work, labour and machines.

He identifies the eotechnic phase – from 1000 to 1750 – as the dawn age of modern technics, with the clock and glass as the defining type of machine and material, respectively. In the late 1800's starts the period, defined by the invention of electricity, that he refers to as the neotechnic phase. It was in this phase that the liquid crystals contained in every screen around us were discovered by Otto Lehmann via Friedrich Reinitzer.

*'Violet and blue colours appear, which rapidly vanish with the sample exhibiting a milk-like turbidity, but still fluid. On further cooling the violet and blue colours reappear, but very soon the sample solidifies forming a white crystalline mass.'*

Esther Leslie is Professor in Political Aesthetics at Birkbeck College, London, and the author of *Synthetic Worlds: Nature, Art and the Chemical Industry* and *Walter Benjamin: Overpowering Conformism*. She also wrote *Liquid Crystals: The Science and Art*

*of a Fluid*

*Form* – a book about the dialectical forms of nature, about the riff between the liquid and the crystal, about the poetics of digitality and its different states of matter, about screen makers looking for new materials and the silicon heart of the ‘consuming-producing society’. Magical materialism perhaps.

Through this book I learned about the history, politics and poetics of liquid crystals. But also, I started to gravitate towards extremely low and high temperatures as a way to transform materials, such as ice and clay, and LCD screen waste, to produce frozen and glazed surfaces, to close my eyes and find the crystals of the mind and imagine other types of screens, oddities with a chemical connection to actuality, to what she calls the Liquid Crystal Epoch.

The book begins: ‘There is an old image of liquid crystal. It is an image of liquid turned crystal and crystal amid liquid.’

A glaze.

Geraldine Juárez: The aestheticisation of politics is everywhere today, but what is the difference with political aesthetics? And how do you end up defining your theoretical work as such?

Esther Leslie: Politics has always been a certain showmanship. I suppose that Marx coined something of this when he spoke of the political rule in the wake of the French Revolution, as the revolution crumbles against itself, against universal liberation. The aestheticisation comes across in Marx through a discussion of fashion – and if we think of fashion as a kind of surface, a veiling, a covering over or ‘cover up’ as the English idiom puts it, then this process exists in order that something else occur behind its drapes, its screens. Fashion is a masquerade that changes the surface, but not the underlying situation. Any original materiality is obscured, as it becomes a cipher, not something produced in the great factories of the world and consumed in all its corners. Aestheticisation allows for containment.

Walter Benjamin did most to coin my ideas of the tensions between the aesthetic and the political. For him, in his day, in the 1930s, he perceives how so called ‘cultured states’ – Germany for one – are fashioning themselves as artworks, and with this statement he invokes his vision of fascism as an aestheticisation of politics, a system of illusion, of spectacular representation (mass rallies, uniforms, tightly directed cultural forms, and so on). This is a form of representation – especially in as much as the ranked and ornamentalised masses appear in the newsreels – but it is without political enfranchisement. It is all show. We might see here parallels to contemporary politics, set up around media agendas, played for scandal and cynically exploited.

The politicisation of aesthetics is the flip-side of the coin in Benjamin’s schema. It is a response. In any case, in Benjamin’s analysis, all art is political, even if, and especially when, it refuses to conceive itself as such. The precondition of art is a political presence. Art cannot dodge its connection to a totality in which art is a thing, in which it is a possibility and in which there is not-art. The idea of the politicisation of aesthetics would make clear and conscious what the conditions of art are – how it is made, under what conditions, how it is distributed, viewed, valued, bought, sold, given freely, understood, criticised, ignored – its

labour prized or despised.

To be part of the culture industry, as Adorno and Horkheimer called the realm of cultural production for money, is for art or culture to be understood in relation to markets – in relation to segmented audiences, to profits and returns, to publicity, to policy. Financial models, questions of access, the high price of art, the return on the value of investments, all this is part of art's being political. All this is part of the politics of art – and for Benjamin, the work of Brecht, John Heartfield or Eisenstein would be three methods of engaging with this field, in his time, under the conditions of his time, questioning in their various ways value, circulation, ideology, the purpose of art, distraction, propaganda, the relationship of image and world, beauty, horror, lies, violence, war, social relations.

There is a wider context to this too – the politicisation of art or aesthetics relates to questions of sensuality. In 1843, Karl Marx appropriated Hegel's categories of subject and object, master and servant, individual and community, ideal and real, nature and history, and transposed them to his contemporary class society. The question of the aesthetic – and its embodiment in the senses – is key. Marx outlines the human as an artwork, the result of a gestation over time and through experience. Across centuries of labouring and collective association, humans develop sensuous capacities, their abilities to discern and produce things of beauty. Marx states that: 'The forming of the five senses is a labour of the entire history of the world down to the present.' The subjective senses, a musical ear, an eye for the beauty of form, aspects of what Marx calls the 'essential powers' of humans, are cultivated socially and historically. But those sensuous capacities are disseminated unevenly. They are cramped by the injustices of the class system. For Marx, the multiplicity of our senses is subordinated under capital's rule to the sense of having, not being. His call was for the return of sensuous, aesthetic experience to the collective. To recognise this is to understand aesthetics politically, because it understands it as a question of access, of pleasure of self-development. All this I wish to track.

You've written about the chemical industry of colour, a quite intoxicating topic, but your writing – the way you engage with history, science, technology, media and materials – is

also quite intoxicating. Poetics is quite a strong characteristic of your writing. How do you negotiate the tension between the rationality of science and technology and the poetic language of imagination to achieve this style? What are your political and aesthetic influences in relation to writing?

I think that the rationality of science can only be negotiated with poetics, with other thinking, with an escape from the logic that asserts itself in the realm of science. In any case, when it comes to science there is really, in actuality, nothing more poetic, in terms of what is proposed, what found.

I often go back to Walter Benjamin on Kafka. He is thinking of Kafka's *Metamorphosis*, when Gregor Samsa wakes up one morning as a beetle and so comes to experience the world as an insect, one that dies in the course of the story. Benjamin speculated that Kafka's imagination of animal experience inhabits the same universe as that of the new physics of the 1920s, as promulgated by Arthur Stanley Eddington. His explorations in quantum mechanics asserted the logical impossibility of human existence, when perceived from the quantum level. To go into a room is a complicated business:

*'In the first place, I must shove against an atmosphere pressing with a force of fourteen pounds on every square inch of my body. I must make sure of landing on a plank travelling at twenty miles a second round the sun – a fraction of a section too early or too late, the plank would be miles away. I must do this while hanging from a round planet, head outward into space, and with a wind of aether blowing at nobody knows how many miles a second through every interstice of my body. The plank has no form or substance. To step on it is like stepping on a swarm of flies. Shall I not slip through?'*

The fantasy of being-animal is aligned by Benjamin to the different conceptualisation of being, and movement, articulated in quantum physics and translated into literature. I want to translate this strangeness into theory, re-joining the broken parts of thought and analysis.

In any case, I often found, when researching the developments in science, that scientists spoke of visions or



d r e a m s  
or hallucinations in which a  
problem resolved itself into a sort of sense  
for them. I am developing currently an aesthetics of  
turbidity, or, alternatively, it could be called a study of turbid  
media – which points up both the media aspect and another mean-  
ing – turbid media means muddy water or particularly polluted air in  
which the particles of poisonous dust are so dense as to be visible. Aesthet-  
ics of turbidity, or turbid media are related to ideas of the pleasure inherent in  
watching particles float on the air. It is also related to trying to think again the notion  
of medium – media – what carries the signal, medium, what we look through to see the  
message, medium, what is placed between us and the thing to be seen, or medium as what  
is seen. Is that a scientific or a poetic endeavour?

And if poetry – in its broadest sense – is the technique whereby atmosphere, mood, analogues,  
metaphors, layerings, significance are deployed, where gatherings and overflows of language,  
image, idea, overtones and undertones occur, then may it be, might it be the technique through  
which occurs an exploration and communication of the raising, harnessing, and manipulating of  
the political temperature of the times?

**I read before that you are fascinated by the notion of 'material'. Is there a material you are particu-  
larly drawn to and why?**

I am drawn to anything that glitters or is iridescent or twinkles. Since I read this line by Georg  
Simmel, published in 1908, I have thought about our bodies as surfaces for adornment which,  
with its glimmering and reflection, enhances us substantially – what is at work is an aes-  
thetic power that enlarges the radius of the self, makes it transmit, become 'radioactive'.

*'Adornment intensifies or enlarges the impression of the personality by operating as a  
sort of radiation emanating from it.'*

For this reason, its materials have always been shining metals and  
precious stones. They are 'adornment' in a narrower  
sense than dress and coiffure, although these, too,  
'adorn.' The radiations of adornment,  
the sensuous attention it

provokes,  
supply the personality with  
such an enlargement or intensification of  
its sphere: the personality, so to speak, is more when  
it is adorned. Material melds with the fleshy material of our  
body, augments our mind, our sense of self and others sense of us.  
Nowadays, I think of smartphones as a kind of jewel that radiates in the  
same way – we hold it about as near as a necklace or a bracelet and channel  
ourselves through it.

I also like matter that is in-between states or indeterminate or does not fit into the usual categories. Soft matter – liquids, colloids, polymers, foams, gels, granular materials, and liquid crystals – are all self-organising, atomically capricious materials. They possess capacities, such as liquid crystals' birefringence, generalised elasticity, mesoscopic, intermediate scale, symmetry-breaking, degrees of freedom coupled with responsiveness to inputs. These odd physical chemical components lend themselves to complex systems approaches. Liquid crystal is slimy. Mucus, slug trails and cell membranes are liquid crystals, existing between solid and liquid, as are detergents and soaps when dissolved in water. The matter may be banal, but there are photographs of what occurs in slimes, froths and foams, when seen through polarising lenses or in microscopic details, that deliver a new beauty, phenomenal delights.

In your essay 'Walter Benjamin: Traces of Craft', you make clear that Benjamin's work should not be understood as a nostalgia for authentic forms of experience provided by craft and handmade objects, such as ceramics, and specifically pot-throwing. His thinking provides an update to the transformation of 'authentic' experience through technological media objects, such as film and photography. Their importance resides in the chemical connection of these mediums to actuality, and the new tactility found in copying, in modernity.

But with digitisation, film and photography circulate endlessly through networks as packets and as images on screens, and their constant mutation, the copy, is the connection to actuality as opposed to their chemical composition or industrial process.

What is the *kraft* of craft today, especially in ceramics and given its chemical connection with actuality, in the



context of  
today's media landscape –  
one where in your words, 'the arabesque  
of labour, experience and selfhood' is being constant-  
ly atomised and not by coincidence, through LCD screens?

How quaint ceramics might seem in the age of plastic, of throw away plastic containers that pile up as toxic mountains and seep into the ground, in the sea. I know they are not quaint – it is still big business, but it does not dominate our fantasy of what a vessel or a plate is. The thrown stuff that is clay seems like the good and pretty sister of the evil one who is thrown away but never disappears.

Ernst Bloch wrote about an old pitcher, a dark brown clumsy jug with a face on it. He imagines himself inside that jug, inside its belly. Bloch wonders what it looks like inside 'the dark, spacious belly of these pitchers'. He would like to occupy that space — just as a child might actually sneak inside out of nosiness. Bloch treasured the cloddish and crude, the brown, heavy and inhabitable jug. The jug grows, like a plant grows. It is all that is in its environment. As a self might be sent inside it, internalised, in its form, so too that self is externalised in its form. This jug is a product of labour. It takes its place within a culture of use. Selves are expressed through it, the maker's self, the user's self.

We are, Bloch thinks, made through and of that clay, a mud, composed of weathered granite rock, of decomposed feldspar, drawing water into its crystal structure. We are golems. He was the jug. Can we be the Tetrapak? Can we be the coffee bar cappuccino cup? These things arrive with us from far away and do not seem to contain us.

This is the world of industrial, globalised capitalism. It has remade things from the bottom up, every practice, every process, every hand that is now not a set of fingers curling and uncurling around udders, or pots, but rather just electrical conduits on touchscreen interfaces, triggering micro-events. Technologies are badged as aseptic, clean, and green – and yet the rubbish piles grow higher and higher and the sense of alienation extends.

Don't we know these new vessels to be our enemy,  
for now they are marked as destroying  
our seas, our planet, and

yet, much  
as we revile them, their piles  
grow high. We are not asked to curl up  
inside them. Sometimes the foam on a cappuccino  
turns sculptural. Now it is the microfoam or froth in which  
our forms are sculpted or painted.

I read recently of the 'selfieccino' – self-portraits in froth, offered by an upmarket coffee bar: an image of customers' faces on the foamy topping of their drinks. 'Patrons send their headshots via an online messaging app to the barista and are given the choice of either a cappuccino or hot chocolate as their canvas.' These seem an emblem of our evanescent social form or foam, proximate bubbles, jostling, but not really touching, our moments of meeting brief and fragile. But froths and foams are especially transient. Of course there are new clays that are at least a by-product of contemporary production.

In China there can be found vast lakes consisting of a slow flow of sludge, a radioactive clay that comes there as waste from the rare earth mineral refining factories. These lakes contain tailings, substances left behind once ore has had its economically valuable parts stripped out. The leftover settles in in mud, which prevents the toxic tailings from dispersing on the wind into populated areas. Some photographs of these lakes have used the quality of particular lights to tease a glistening glow from the murky quagmire which mirrors its relation, the sheeny plastic of a smart phone's casing. This sludgy pond hosts the remainder from the chemicals that provide the underside of the liquid crystal touchscreen, the coating that monitors changes in electric state on the screen and is composed of rare earth minerals and metals, highly conductive ones, ones that can be easily deposited on the glass as a film and are optically transparent.

A podcast from the Smithsonian notes the following: 'Oil is the blood; steel is the body; but rare earth elements are the vitamins of a modern society.' Somehow this stuff that makes our digital society flow and glow is an enhanced, the very stuff of life, essential to our metabolism, but needing to be continually deployed, ever augmented, optimised, bought and supplemented, and for those who do not take their vitamins, who have not bought into them, there will be reduced capacity, self-inflicted ailments, a general inability to function in modern society. The digital epoch changes so much.



We think  
often of the redundancy of  
humans in the face of digital machines and  
robots. This redundancy is likely to be less a making  
invisible, and more an increased visibility, the humans as un-  
deractive fleshiness, as problems, as recipients of phony universal  
basic incomes, as consumers at any cost because that is the rationale of  
the system. Those machines can make anything. They use their digital clays to  
mould anything that can be imagined, and things that are not.

This is a new craft, one craftiness enough by itself to seem not to need humans. But,  
perhaps what is created, because the human will not go away, is a *kraftfeld*, a force field, a  
relational electrical field, or a magnetic or gravitational one, a force field which is a region of  
space around a body – around the machine – which, as with a charged particle – exerts a force  
on other bodies not in contact with it. So the digital machines exude a force across the whole of  
society and sometimes we touch them, and even when we are not touching, our worlds are still  
being reshaped and remade for us.

**In the same essay you conclude mentioning the doctrine of *tikkun*, ‘the secular and divine task of  
putting the world back together [...] using debris and rubbish.’ This is a question of excess, of re-  
sources and therefore of politics. Is the recirculation of waste a ‘montage praxis’ itself?**

There are new stones that are a collage or crashing together of sedimentary grains, shells, wood  
all held in a clump by hardened molten plastic, which is made of fishing debris, broken lids,  
other plastic flotsam and jetsam. Campfires perhaps melt these plastic confetti into a liquid  
concoction that seeps around rocks and sand. These have been named plastiglomerates by  
Patricia Corcoran, Charles J. Moore and Kelly Jazvac.

This is second nature, or a new and other nature that is a result of a montage of  
natural matter and waste. They are both beautiful and monstrous – or per-  
haps not so much beautiful as sublime, terrifying and wondrous. Would  
it count as a montage practice resultant from the recirculation of  
waste? I doubt it. There is something uncontrolled about  
it – it happens as a result of our polluting practices,  
and is an accidental by-product.

It is not  
the same as the conscious  
practice of recycling of detritus by margin-  
alized figures, outsider-poets, mothers of invention,  
artists of poor means: they recycle litter as lyric, littoral and  
leftovers as landscape painting and junk sculpture, which, through  
its transformation, converts into a critical commentary on value and on  
what is under or unvalued economically and socially. Recycling is a re-circu-  
lation of things discarded, things that have fallen out of the system of circulation.  
This is why a wheel has at a point been their emblem.

The first found object artwork is usually reported to be Marcel Duchamp’s ‘Bicycle Wheel’  
from 1913. Kurt Schwitters made the most audacious attempts to recycle rubbish as art. He  
took his wrapper, tickets, scraps of lace or tissue, children’s toys, and cogs and wheels, and set  
them into patterns that appeared to be motivated by a set of purely aesthetic values: questions of  
composition and rhythm, surface and line. This is the art of waste.

But those composite stones are art, in another way. They exist in the world, on the beaches of Hawaii  
or elsewhere, chunks of historical nature, but I know of them only through beautiful photographs  
that stage them and bring them out of their space into mine. These composites might leave no fossil  
trace. It may be that the plastics eventually dissolve back into the oil of the seas from whence they  
once came.

This reminds me of the film from 1957 by Alain Resnais and Raymond Queneau, an advertis-  
ing film for the chemical firm Pechiney, titled *The Song of Styrene*, which depicts in reverse  
polystyrene manufacture and processing through the production of colourful plastic items,  
including a red bowl. All are newly born. It comes to be un-constructed through the  
course of the film’s 13 minutes, taken back to an original moment, an original mat-  
ter, out of which the magic of science and technology will conjure a bowl or a  
plug or a spoon: oil. Resnais and Queneau are Romantic on this point: we  
are taken back to this oil of the seas, itself a product of life and death,  
sharing some sort of common origin with something that became  
human life.

As we see masses of coal undergo  
firing, the film text



m u s e s :

'Does the oil come from masses of fish? We do not know too much of where the coal comes from. Is oil coming from plankton in labour?'

I came across this film by meeting someone in a research grouping: called 'Times of Waste', based in Basel. Their project operates through what they call 'object biographies' – and so Resnais and Queneau's film is an example of this form, as it traces the biography of a styrene bowl, though only in the process of production, not into its consumption or distribution. Times of Waste explored particularly what they see as the new contours of waste, and the waste inherent in new materials such as those that will come to be e-waste. Nothing is wasted now – they observe. Waste is the new treasure. Waste is not the end of a process but its beginning. Waste is the hysteron proton. The project states: "'waste" may be thought of nowadays as a reverse figure: extensive cleaning and recycling processes as well as recent developments like "urban mining" regain reusable raw materials out of waste. Waste is hence considered as a "new resource", dynamic and transformable.'

Waste is not to be wasted, not least for capital.

I'm glad you brought up the question of second nature. 'Synthetic Worlds' changed my understanding of colour forever, only after reading it I started haunting colours in my mind too. Colour is haunting but synthetic colour is just brutal. Both, synthetic colour (chemically industrialised, subtractive) and artificial colour (simulated by artifacts, additive) rely on the logic of extraction to reproduce the world in their own brutal ways. Once colour manifests, another set of problems emerge, since as you wrote, colour 'is so contingent, so circumstantial, so refractory'.

Colour is unstable and always try to escape; it needs to be controlled, synthesized. I understand this as a problem of 'third nature'. I am interested in your thoughts about third nature and I wonder if natural magic and third nature are different names for the same thing?

This leads me to something Tristan Tzara wrote and which Walter Benjamin translated:

*'When everything that*

*called itself  
art was well and truly riddled  
with rheumatism, the photographer lit the lamp  
of a thousand candles and step by step the light-sensitive  
paper absorbed the blackness of several objects of use. He had discovered  
the momentousness of a tender and unspoilt flash of lightning,  
which was more important than all the constellations designed to bedazzle our  
eyes. Precise, unique and correct mechanical deformation is fixed, smooth and filtered  
like a head of hair through a comb of light. Is it a spiral of water, or the tragic gleam of a  
revolver, an egg, a glittering arc or a sluice gate of reason, a subtle ear with a mineral whistle  
or a turbine of algebraically formulae? As the mirror effortlessly throws back the image, and the  
echo the voice, without asking us why, the beauty of matter belongs to no one, for henceforth it is a  
physico-chemical product.'*

For Tzara, the object is crashed out of habit in the flash of photography, but equally it could be the actions of chemistry or physics. There is an illumination, which results in a new and revolutionary beauty. Matter comes to speak about itself, and this is a magical act, as much as it is material. The shiny black of coal deposits have locked inside of them a previous world of life along with all its colours. That compound inertness, dead but once upon a time swarming with original life, could issue from itself – from its coal tar waste – life once more in all its multiplicity of hues. Life is colour.

As Goethe previously put it in *Faust*, 'Am farbigen Abglanz haben wir das Leben', 'Life exists in colourful reflections'. The transformation of dark matter into a rainbow of colours must seem like a series of alchemical acts. Like turning rubbish into gold, decomposed matter becomes coal, and then in addition, that waste's waste, coal tar, becomes colour.

Out of dark matter its twinkling opposite is released. Extracted in the act of chemical modification is a magical potency. It seems like magic. It is not, just as alchemy is not chemistry, but it resonates in us as if it were magic. That it seems like magic is part of its fetishized existence – that we cannot understand these processes, just as we cannot understand economic form, and just as we might believe the world and its things are more lively than us, who exist only to bring these commodities into being and to consume them.

Third nature is a new seemingly magical world that exists only



as a result  
of infrastructures that are  
highly capitalised. At its more fantastical  
ends, it provides extraordinary images of the world  
remade from the atom up according to the digital command.

Radical atoms are pixels released into the environment, made 3D and ubiquitous. They congregate to make forms and materials that can transform their shape, colour, properties, through digital or other stimuli, heat, light, sound. It becomes a question of the management of inputs, the flow of currents, the direction of heat, the manipulation of acidity levels to impact on optical properties, size, shape and activity. In this scenario, energy from the temperature of the body, from the light of the environment, could be extracted as a power source for devices, a radicalisation of its current use within the circuitry of the touch screen device. They would charge as we exist, as we emanate from ourselves, holding them, and they exist then without the tangle of wires, transformers, sockets. Ubiquity is not just being integrated into all of our activity. It is co-existing, or synonymous with each cell of our body, each fluctuation of our body temperature, each shadow we cast or remove. This is the bleed.

Technologies bleed into the body, into the brain, the brain bleeds, the body seeps, interfaces, and is brought into a situation of responding to the responsive materials. The bleeding edge is technology not just on the body, but integrated into every atom of that body, every atom of that world, whose capacities are augmented so that it might account for every state from fixed to flowing, from liquid to crystal. This is the technological sublime that changes nature forever. The height of this imagination: a computer implanted directly into the eyeball not only augments the bejewelled surface of what it sees with data feeds, it exerts the ability to shape-shift what it looks at through the energy of thought. The solid liquidates and then reforms. Liquid crystal, the sliminess of matter, is mobilised for a vision of a world that is subject to transformation, improvement, beautification in the light of the hi-tech, post-human engagement with nature.

In 'Synthetic Worlds' you suggest, 'to rely on the colours of dreams, of the mind's eye, the colours of fantasy, imagination, memory, which continue to shine brilliantly, even when the lights are off, your eyes are shut.'

Do you  
have a favourite colour  
of the mind and where it takes you?

I think the colour in my mind's eye is an iridescent one, changeant, as they say or 2-tone as the Mods and Rude Boys called it. It shifts from a lavender-purple to a soft rose-pink and takes me into the wardrobes of nineteenth century women, with noisily rustling silk dresses and petticoats, who I have never met, at least not outside of books.

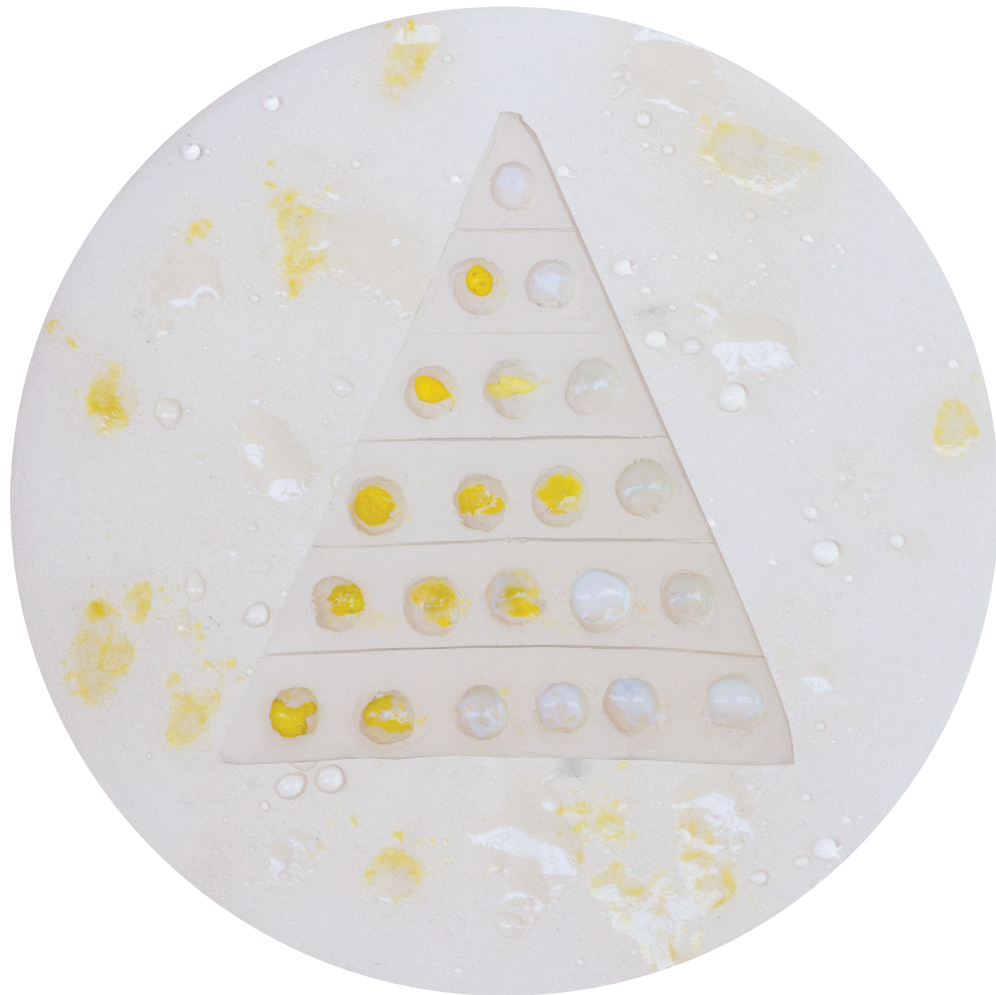
Colours and archives haunt us. In different or similar ways?

Colours are part of the archive. They decay as the documents decay, they also, like ice cores, mark time within them. Colours are such markers of a time, of a moment in history when a particular technology was possible, desirable, the only available option. This is why, over time, held in the archive, colours, become uncanny, familiar and unfamiliar, dead, yet voluble. They are documents of the past and of their present.

Inside the archive, everything turns to trash – chemicals decay, colour deregisters, fades or seeps. Documents, items, betray their own fragility, and in their manifest volatility, they model transience, history, and the passing of time. That may sound bitter-sweet, but it is something that is of the document as it dies or extends into its half-life. The archive is a place of ghosts. I spend too long in them, including in the one I carry as a set of memories in my own head.

I love the way glazed ceramics interact with light. Colour production is not additive like in LCD screens or subtractive like in painting or textiles. Glazes are not either or, since colour is not achieved by mixing pigments but by firing. Colour emerges from heat. But once the glaze is fired and locked to the surface, light reflection depends on the composition of the glaze. The laws of additive light are also defied. In contrast to screens, the ceramic surface does look back. Maybe this is not a question, I am just interested in your thoughts on chemistry, colour and ceramics.

That association with colour and heat is something Michael Taussig talks about so beautifully in *What Colour is the Sacred?*.



*'Isidore  
of Seville, the savant's savant,  
said in the seventh century AD that color and  
heat were the same since colors came from fire or sunlight  
and because the words for them were fundamentally the same: calor  
and color. Etymology like this is hardly a science, but he was onto some-  
thing important, same as the famous connection between color and the quick  
spirited drill of the Berbers incorporated into the colonial army. And note Isidore of  
Seville did not say light, but sunlight, light that comes from the biggest fire of all, the one  
that gives without receiving.'*

Colour as calor becomes for him something bodily, alive, like an animal, not just something seen with the eyes. It is felt. It is like the colours that dance in the fire, as we stare into it at night and follow the orange sparks that dance and rise on warm air. In those licking flames we see whole stories and we feel them too, or at least the heat. In that heat, we could fire something, melt its molecules, like people have been doing for a long long time. It is exciting that some colours emerge only through their transformation in heat, affected by specific temperature, the atmosphere, the material make-up, what else is on the body of the ceramic. This lends unpredictability to the process. It is a relational act in itself. I have seen chrome characterised as 'chrome oxide'. It gets subjectified, made wilful.

I did a little bit of work on ceramics for my project on milk. I was interested in milkiness. Clay and milk have a long-standing kinship. Some of the most primitive vessels were containers for milk, as is evidenced by fat particles found in their clay and on tools. And just as over time milk has undergone modes of purification, so clay too has been nudged toward purity, which manifests as whiteness. Porcelain is milk's analogue: white, purified, luminous and numinous. European potters struggled to emulate its fine glassy whiteness, once it was imported from China, until they cracked its chemical secrets, or settled for imitations.

Raw clay, like raw milk, is subjected to processes of refinement, to smoothing out, to homogenizing. Like milk, porcelain adjusts to standardisation, and so to the market and its demands. It shares with milk the ability to take on form and accept colour.

Away with the brown and earthy and  
in with the creamy and

m i l k y :  
 that is the journey of pottery  
 as stimulated in my country, England, under  
 Josiah Wedgwood's hand. Porcelain is often de-  
 scribed as 'white and beautiful'. Its exquisiteness is hitched  
 to its whiteness and its radiance is best shown off in a homoge-  
 neous paste. Wedgwood's first successful earthenware was made to as-  
 found a Queen consort in the 1760s and he was allowed to change its commer-  
 cial name from Creamware to 'Queen's Ware'. This created a large market for fine  
 white pottery. Wedgwood wrote in his letters of his pursuit of 'a white Earthenware  
 body, and a colourless or white opaque glaze, very proper for Tea & other wares.' These  
 white cups were to contain the bitter and sweet fruits of Empire. He blanched his Cream-  
 ware by including china clay and a small amount of cobalt which gave a blueish cast to the  
 glaze, and he named it Pearl White.

It should be noted too that porcelain is often defiled – toilets, bathroom basins, all these receptacles  
 for bodily waste. The lack of pores in porcelain gives it a smooth surface off which all waste  
 will slide, and, as an inert material, it does not react with the water and air that daily beset it and  
 so will never corrode or oxidise. This thing of mud made pure becomes an emblem of purity, even  
 when brought up against muddy impurities. In whatever way, these ceramics assert themselves,  
 their properties, play their own role in what comes of them, but it is not to be underestimated how  
 entwined their histories are with plunder, harsh conditions of labour, the vicissitudes of fashion.

In England, there was a rival to porcelain: bone china. Its production technique developed in  
 order to shrink the importation of porcelain from China, which was severely taxed at the end  
 of the 18th century. It also helped to serve a growing bourgeois market and was favoured  
 for its lightness and strength. Some say its origin was the result of a misunderstanding:

that the name 'bone' was assumed to be an ingredient, not a description of its colour.  
 Bone china is made from cattle bones, which provide half to a third of its contents,  
 and is first processed to remove the matter that adheres to it. What remains,  
 the inorganic residue of bone ash, is ground finely. It lends the cups and  
 bowls it forms a milky white colour and a translucency not pos-  
 sessed by porcelain. It is as if the ghosts of cows and goats  
 shone through. Now China produces most of this  
 material, for export.

Histories  
 reside in these materials and  
 in their colours and glazes.

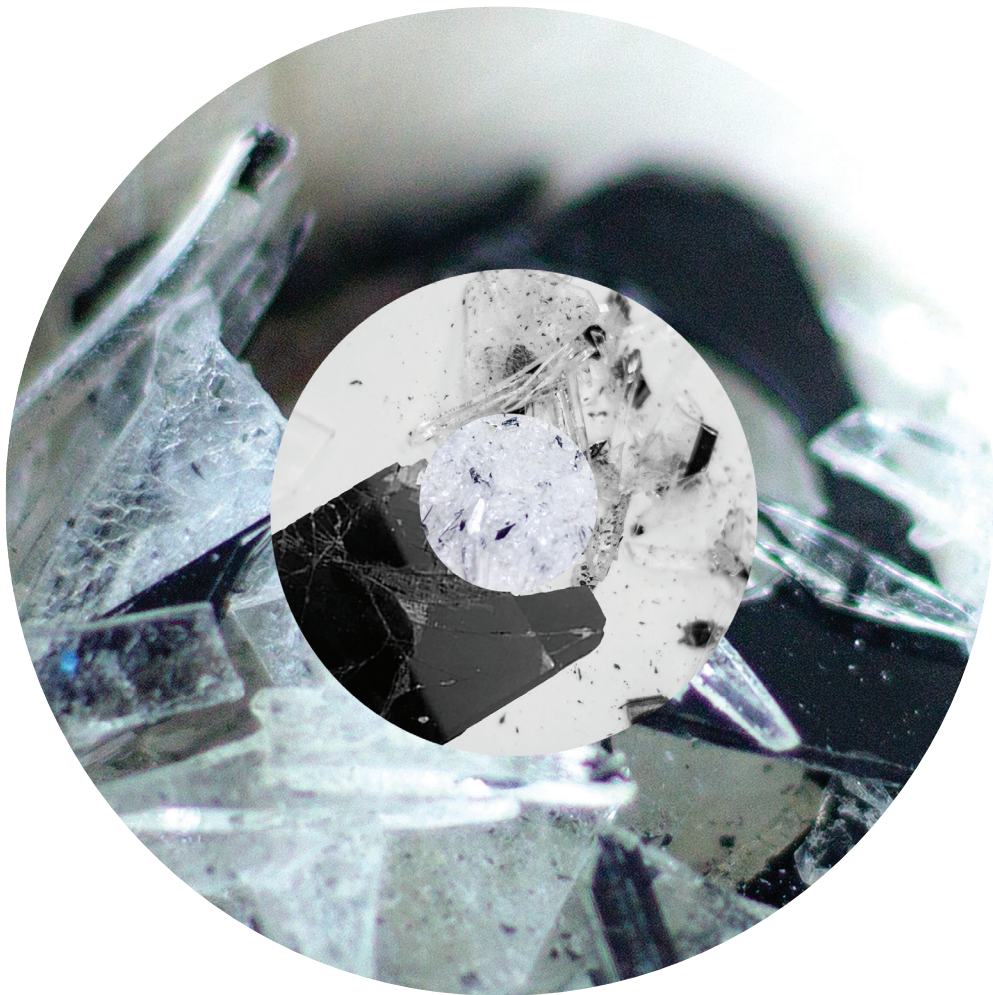
In 'Liquid Crystals', your brief chapter on glaze delves into  
 glass, which is not a crystal but it shares some properties with crys-  
 tals: transparency and light reflection, the latter being the condition for  
 colour to manifest. I wish that chapter was longer. Would you expand a bit  
 more on glaze in relation to your dialectics of crystals and crystal-like materials  
 that make possible for capital to accumulate, to crystallise?

The word glaze comes from the word for glass. I associated glaze with glare and dazzle,  
 maybe just a poetic association from the syllables. Glare and dazzle are both connected to vi-  
 sion and to its frustration or denial. The glare of reflection, light bouncing off a surface makes  
 it hard to see anything. The dazzle of light confuses, as those who made dazzle patterns as cam-  
 ouflage in the First World War well knew. Glaze, then, immediately conjures up an image of dis-  
 traction, deception, or indeed a covering over. People can glaze over – it means they have started  
 thinking about something other than what they should be thinking of and this is reflected in eyes  
 that become dull and expressionless. They are no longer seeing, as well as not hearing.

I used the word glaze as a title for a section on the great glass edifice built in London, which was  
 the Crystal Palace. This was a palace to industry, or commodity culture, apparently progressive  
 technology, the might of Europe and the justified booty of its colonial escapades. I was thinking  
 of that glass in the Crystal Palace being an emblem of the development of a glassy culture, in  
 which we are to look but not touch, the culture of the spectacle, or the command to consume,  
 to first drink in all that is on offer. Along almost ten miles of displays, it was possible to  
 see the world's largest diamond, steam engines, an envelope manufacturing machine,  
 artworks, stuffed kittens and squirrels enjoying school lessons or tea parties. All this  
 you can look at. Once you have paid, somewhere else, another time, you may  
 pick it up, consume, dispense with, get another. The glass of the palace and  
 the glass in the palace is a barrier. It is also a glint to draw the eye.

Charlotte Brontë reported on her visit:

*'Whatever human industry has created you  
 find there, from the great*



*compart-  
ments filled with railway en-  
gines and boilers, with mill machinery in full  
work, with splendid carriages of all kinds, with harness  
of every description, to the glass-covered and velvet-spread stands  
loaded with the most gorgeous work of the goldsmith and silversmith, and  
the carefully guarded caskets full of real diamonds and pearls worth hundreds of  
thousands of pounds. It may be called a bazaar or a fair, but it is such a bazaar or fair  
as Eastern genii might have created.'*

The glass covers the superior glassiness of precious crystals. The senses are intoxicated, as in the fantasy Orient dreamt up by Victorians in England. The invitations to a paying public went far and wide. Those investors in the project hoped to recoup their outlay through the entrance fee – and this necessitated, perhaps for the first time, pushing deeper into the pyramid, drawing in the masses. It was not cheap, though (not to speak of transport costs, food, the loss of that day's work and so on). In the later days of the exhibit, it was possible to go in for a shilling. This was no small amount though. Those glaziers who set in place the 900 000 square feet of glass earned for their efforts the wage of a skilled person, four shillings a day. Everyone is to be dazzled by the emergent commodity culture, by the capacities to make baubles, to turn nature into a snow dome, and grow trees within the building, this structure modelled on a botanical palm house.

In this way, capital naturalises its place in the world. This glass building is imagined by me as a proto-smartphone. Under glass the entire world is as if touchable. Under glass everything becomes an advertisement, an advertisement for itself, for this way of life, for the economic system, for the marvels of our technology, for the presence of competition in the world, for the fact that the system does deliver us exactly what it is we think we want. And we are never to be bored. At the same time, while we look, we are looked back at. The Crystal Palace witnesses the birth of the consumer. The smartphone witnesses that consumption has become a life's work. The glaze of the building and the smartphone, its glass cover, is a casing between us and the goods that we have ourselves made, in a species sense, but that are now alienated from us, sold back to us, presented as more lively, more exciting than us. This glaze is a separator. It is the material sheath of the commodity fetish.

A glaze is also a broth, a gelatinous edible layer on meat or

o t h e r

foodstuffs. This relates to an idea in Marx on 'gallertes', a name for a jelly of meat, bone, isinglass, stag horn and the like, which he uses as a metaphor for the jellied form of labour power exerted by workers and congealing into an undifferentiated mass of abstract labour. Thus it is quantifiable and alienable. It is an image of the ways in which human labour mixes into a brew of production and thrusts the idea of deadness to the fore. A glaze enhances too though – it makes something more beautiful, more dramatic. It makes things dazzle. It attracts us. Until the effect wears off, and we glaze over, return to our dreams as more unpredictable, knobbly or enticing.

Glaze is a smooth coating of ice formed on objects as a result of the freezing of rain. It seemed to me an image of the coldness inaugurated in the spectacular capitalist society – beautiful, chilly, frozen, ahuman. Marx talks of crystallized commodities, crystals of value, and in the metaphors of Marx's value, it might be said that the use value is a kind of kernel object, the core, the thing in itself, but the exchange value, the object as commodity is that same object enveloped, not by a protective etui, but by a crystalline glaze.

Ceramic glazes are a form of vitreous glass but not really crystals, although some glazes infused with zinc oxide can produce actual crystals in the surface. Clay, glass formers, fluxes and oxides create magic as they react to heat, kiln atmosphere, time and speed. The kiln becomes a magic hat and when you open it, the surprise is not a rabbit but the colour and texture of the rabbit. Natural magic or Magical materialism perhaps?

The natural magic happening inside the kiln is closer to volcanos and lava than slush and icebergs. Dreamworld is created by heating materials until they liquefy, colour emerges from a molten state, as the glaze runs and cools down a crust is formed on the surface; it makes beautiful, protects. I wonder if you thought about ceramic glazes when you were writing 'Liquid Crystals'?

I love melted glass and lustreware and Chinese ceramic glazes. I was pulled towards coldness in this book on Liquid Crystals. It is only lately, in thinking about milk, in

a project

with Melanie Jackson titled *Deeper in the Pyramid* that I have been drawn more towards heat, to the fusion power of heat. Specifically, I have been thinking about the generation of new crystals through heat, such as Trinitite or Atomsite, generated as residue on the desert ground around the nuclear blast tests on 16 July 1945, near Alamogordo, New Mexico. These blobs of pale green glass are quite thin and the upper surface has its own glaze, a sprinkling of dust that fell on it while it was in a molten state. The nuclear explosion provided an image of melt, of uneven density, of sprinkles and frozen novelties caught at a moment of flux, worlds of turbidity, troubled worlds, a world troubled at the atomic level and all the way up.

When I think of volcanoes, I think of Walter Benjamin's image of ruination. For him, the volcano is a petrifying mode of destruction. Though a natural eruption, it played a role in the social fantasy of French nineteenth century commentators who repeatedly imagined the devastation of Paris. Benjamin states that they actually intuit the approach of a human-made catastrophe. He also uses an image of the volcano to criticise the damaging effect on the child of the drill of school in Wilhelmine Germany. In his autobiographical snapshots of 'A Berlin Chronicle', he finds in his memory of school:

*... rigidly fixed words, expressions, verses that, like a malleable mass that has cooled and hardened preserve in me the imprint of the collision between a larger collective and myself. Just as a certain kind of significant dream survives awakening in the form of words when all the rest of the dream content has vanished, here isolated words have remained in place as marks of catastrophic encounters.*

The volcanic lava of language congeals in the self, making our very innards products of a corrupted social existence. Benjamin, like lava, like a photograph, records an imprint of a catastrophic history. But this is not to say that the ruining, melding, violent unpredictable acts of volcanic melting could not be vectors of new beauty, or even social fusion. There is an interesting gap between process and result.

The process of fusing, the magic inside the kiln, the unseen, the glaze's unconscious workings that are then



revealed,  
solidified, made, finished,  
crystallised, cooled for us, on opening the  
hatch. I like to think of it as a protective coating.

Not all things that seem to protect do though. I have been concerned with foams lately. Foams are meant to cushion, to insulate, to protect, and yet foam was precisely a factor in the horror inferno that was the burning of Grenfell Tower – an inner polystyrene foam, a 50mm thick layer of Celotex RS5000 thermal insulation of polyisocyanurate, which caught fire and sent ‘flaming droplets’ to fall onto lower floors while helping flames to spread higher up and releasing toxic gas into the atmosphere. Its dangers were already known, communicated by the Fire Brigade and others, but who cared? We can never be complacent in matters of protection, and for what or whom.

There is a software called f.lux that adjusts the colour temperature of screens to reduce blue-light. The program works based on location and time. The goal is to mitigate eye stains and disrupted sleep patterns produced by 24/7 screen activity. When f.lux is on, an orange-yellow light tints the screen, the hue gets warmer as the night goes on. f.lux flows, to borrow your words, like liquid sunshine.

However, f.lux is not an emancipatory tool, it doesn’t freeze the screen, it keeps it going. Meanwhile, away from keyboard, a flux is on too, decreasing the reflection of sunlight by the sea. Ice is melting – on this you wrote that ‘the politics of the future is the politics of lost ice’, and ‘each mode of articulating aesthetics and politics might come to seem inadequate in the face of the culture industry’. How to contest the politics of lost ice in a transformative way? Since the liquid crystal of capitalism is already inside of us, are other screens still possible?

We are losing ice. I was fascinated in some materials in Susan Schuppli’s *Can the Sun Lie?* from 2014. Here, she, as voiceover, states the following, in a reflection on ‘the different regimes of witnessing represented by scientific expertise and indigenous storytelling traditions’.

*In the Canadian Arctic the sun is setting many kilometres further west along the horizon and the stars are no longer*

*where they  
should be. Something is happening. Sunlight is behaving differently in this part of the world as the warming Arctic air causes temperature inversions and throws the setting sun off kilter. Light is bending and deceiving the eyes that tracked the position of the sun for generations, using it as an index of place and a marker for direction. The crystalline structures of ice and snow twisting and morphing, producing a new optical regime born out of climate change. The sun has finally become a liar, colluding with the melting topographies of the North. So much so that it can no longer be trusted to guide the Inuit hunters home, as it once did.*

Light mingles with the metaphors of Enlightenment, truth, knowledge, leaving the Dark Ages for a time of clarity. But here light distorts in the nature after nature, in the after-ice. A new reality is made, one that cannot be relied upon, one that has to be relearned, rethought, just as the idea that a glacial pace of movement might no longer signal a long-drawn out slowness. Ice relationship to time, to measurement, to storage of knowledge over time is occurring in the context not of a disappearance of nature, but of its new affiliations, imbroglios, capacities, historically attained, which means it persists, but newly, and persists, as Andreas Malm puts it, in an ‘unpredictable relation to the history of accumulation and the class relation (i.e., not “everything is now organized and planned”)

Ice visualised, imagined, discussed, helps us – or me – to see a historical movement, the movement towards an ever-more global capitalism. Its melting there affects here. Its battle, what has become a battle with sunlight, with heat, will play out here. Its breaking off here affects global trade, which we now come to know as global, at the very moment of its being threatened, in its being disrupted, for example, by what headlines might call ‘Wild Swarms of Wandering Icebergs Stalking Boats in the Arctic’.

Ice visualised also allows us to see ice and its melting as themselves historical markers, signs of the historical aspect of nature – in as much as temperature changes over time and in as much as that is produced, at least in part, by humans. Beyond the human impact on ice, that is on its formation and melting, we can track all the ways in which humans have made and unmade ice, shifted it, desired to shift it – like the repeated, failed, projects over hundreds of years



to tow  
an iceberg from the poles  
to somewhere water-deficient, such that  
the ice might be harvested for pure drinking water,  
a scaling up of the trade in ice, or frozen water trade that  
ended only when refrigeration was more widespread. What makes  
these projects resonant?

That time and nature are to be defied. That the ice will not melt, until the precisely correct desired moment, and it will draw along with it rain clouds, and it will bring cool water. This is a project – one that science might set into being – one that will fail or set off unpredicted events, such as the transfer of bacteria from one place to another. These latter-day dreams of ice at human command, ice prevented in its melt, or melting only we command it, ice captured and harnessed, not swarming and wild, have often remained computer dreams, computer ice dreams, locked within the pixels of the liquid crystal screen. Media is not a conduit only, sending out messages, not a language, a series of signs that have grammar, structure, not an ecology that produces human behaviour and in being changed in one part, changes in every part. Rather, it is as well as all of these, a material form that produces atmospherically from itself an environment composed of its own parts, shaped by its own material and aesthetic capacities. There is a contradictory move.

Ice is thoroughly instrumentalised and rationalised, captured by various machineries that make it appear where it never was and disappear where it is not wanted. But ice remains also unpredictable form – is emblematic of the lack of predictability of our age. It is, remains or becomes a perverse frozen fluid that escapes our grip, melts through our fingers. It meddles with time, from a magical neverwhen of eternal return – ice up, frozen wastes, ice fairies and the land of ultima thule – to a momentary action of no return – calving, splitting. These icy spectacles, sunshiny fantasies, need their screens as they become the matter of entertainment or sublime horror, backdrops to more human dramas. They need their light too – the light of California that played such a large role in the establishment of the film industry there.

But they need it less. What they need more is the light of the  
liquid crystal screen, or its successors, the OLEDs  
or whatever new one comes into being.  
The light of f.lux will

light all  
our dramas and let us know  
when to go to bed at night. It will modulate  
without being asked. It will manage our days and  
nights, our work, our leisure, will become a signal, one fully  
detached from the sun, which may, as in Gabriel Tarde's fantasy of  
*Fragments of a Future History or The Underground Man*, give up and cease  
to burn, leaving behind it only a permanent rosy sunset, as we humans scurry  
underground (those at least who are allowed to enter that new world of an elite)  
to read philosophy and poetry, by its light.

The new light will just be there 'for us'. It will douse us like once did the comforting crackly  
gas light of the arcades, casting a glaucous gleam over everything, but mainly over what we  
were requested to look at, don't touch, but buy, and then buy again. There is work on flexible  
screens now, liquid crystal based, able to wrap around our machines and our bodies. We will  
become layer upon layer of liquid crystal, walking adverts. We will be smart, only then.

To make a glaze you need a glass former, a flux and a stabiliser. Fluxes lower the melting point,  
stabilisers keep the glaze locked to the ceramic object. In 'Crowds, Clouds, Politics and Aesthetics,  
Flipping Again' you write that for Baudelaire 'words not only matter, but they become matter'. In the  
Glaciation section in 'Liquid Crystals', a ceramic glaze takes form and runs through the page:

*'...specks of milk-blue, greenish iridescence, thick whiteness, glimmers of jumbled  
crystals, monstrous boulders.'*

This made me think of the riff between volcanoes and icebergs, carbon and ice, colour and  
crystals, science and art. Is language a flux? How we can understand the concept of  
flux from the perspective of political aesthetics?

Language is a flux. The words in this interview have poured out of my head  
with little ability on my part to stem them. It burbles. I burble. There is a  
lot of instability. Communication is an approximation and always  
better if part of a dialogue. Benjamin writes, in a commen-  
tary on Brecht, on the 'the minimum programme of  
humanity' on the line – 'the hard thing  
gives way'. There is a

lesson for  
us here, he notes, observing  
the further lines: 'That yielding water in  
motion/ Gets the better in the end of granite and por-  
phyry.' Benjamin goes on to provide the lesson:

*'The lesson or advice here is never to forget about the inconstancy and change-  
ability of things, and to align oneself with those things which are inconspicuous and  
sober and inexhaustible, like water. The materialist dialectician will be reminded of the  
cause of the oppressed.'*

Lastly, apart from the promise and the theory, there is a moral in the poem. Whoever wants  
to make the hard thing give way should miss no opportunity for friendliness. Friendliness,  
attitude, a meeting together, a melting of hearts, a melding of minds – these orient us – but we  
never forget who are not our friends.

The liquid and the crystal come together in a certain state. They are opposites and they also are  
partners. It is like the word 'to cleave' – to hang together, to be split apart. Freud's little essay on the  
antithetical meanings of primal words might yield a lot for this mode of thinking. That is dialectics  
in language. Language is an archive of aliveness. It is also an archive of alienness.

What are its characteristics of what you refer to as the "liquid crystal epoch"?

In this liquid crystal world, liquid crystal movements on screens are ogled more often than a  
lover's eyes. It took its time to come into being. It began nearly 150 years ago, when the liquid  
crystal was discovered as a chemical, biological form. That little form took a long time to  
be understood and even longer to find some sort of use. Once a use was found for it, in  
screens, there was no longer any tranquillity, except for when we steel ourselves and  
command it or when the technology fails.

It may have taken some time for the liquid crystal screens to be invent-  
ed. But the form was discovered and seeped out of itself, or, alter-  
natively, the world that was in development, on account  
of the movements of capitalism, seeped into the  
mind of the scientists who found that it  
changed their manner of

thinking  
and made the inconceivable,  
a phase of matter inbetween two others, an  
inbetween state, the not liquid, not crystal, possible  
to imagine. Something made it possible for them to believe  
their eyes and give this phase a name. Liquid and crystal flow and  
freeze, like animation, born simultaneously, like photography, like an  
economy expanding as if unimpeded around the world, in imperialism and  
globalisation, and interrupted in that expansion, by the emergence of crisis, only  
then to flow again – but at whose cost?

The screen is liquid crystal – and it lets all history, all social interaction, all data and all  
fantasy flow across it, under it, glowing in it. At any moment, the screen might freeze a single  
moment and somersault its viewers into an unfathomable space where nothing is happening,  
where it seems nothing is happening. This may induce panic. The whole world has been remodel-  
elled, or augmented, through liquid crystals, even three-dimensionally. The cities are luminous.  
We log onto it. At the same time though, these liquid crystals take us into ourselves. We are com-  
posed of them. We are made what we are by them – in our DNA, in polypeptides, in our epithelial  
tissues, which line the cavities and surfaces of organs throughout the body.

Liquid crystals take us into ourselves, our own workings, and they take us in another direction to  
that which the molecular studies of science have followed. Molecular studies have stuck with the  
tripartite division of the world into atoms and subatomic particles that interact in accordance  
with the laws of physics to form molecules, coacervates, an elementary form of proto-cell with  
metabolism, or other aggregates. These forms are usually attributed to one of the states of  
matter: solid, liquid, gas.

Inbetween exists the liquid crystal and not just as a coagulation of liquid and crystal,  
but also as an inbetween of life and death. It has been submitted that, on the Earth  
of the prebiotic era, matter possessing the properties of liquid crystals was an  
antecedent in the evolution of living matter from inanimate matter and,  
in its lyotropic form, it maintains the processes of life thereafter,  
while in its thermotropic form it holds life prisoner of the  
screen.



The binary 'art and technology' has always been suspicious to me. For a while now, the word 'technology' and technological culture at large has been reduced to 'internet' and Silicon Valley gadgetry. Working with ceramics expanded my definition of 'technology' and reinvigorated my interest in technological culture and media history in a new way. A kiln is a fine piece of technology. Ceramics is a practice about constant synthesis.

Isn't all art to some degree technology? Even language is a technology. What's the place of craft within the 'art and technology' binary? What are the political implications of artists stepping into the techno-scientific via aesthetic experiments?

I agree that the word technology is a misnomer and the idea of 'art and technology' misses out how much all art has always been technological. I always find myself thinking about Walter Benjamin's line:

*'...photography discloses in this material physiognomic aspects, image worlds, which inhabit the smallest things, interpretable and latent enough to have found a bolthole in daydreams, but now, as they have become enlarged and articulable, they make manifest how the difference between technology and magic is a thoroughly historical variable.'*

Our technologies are conduits to smaller and smaller parts of the world and what we find therein gives proof to the idea of magical subworlds, of places where physics does not work as we expect, where things happen in reverse or bodies pass through solids, where life lives faster or there are multiple dimensions. Technology is just a kind of mediation, a means, a mediator.

I was also drawn to Walter Benjamin's ideas of first and second technology many years ago in my PhD and the distinction has never left me. It places in me the idea that even technology is not just technology, but a relation. Benjamin distinguishes between first technology and second technology, much as in other contexts post-Hegelian philosophers have distinguished between first and

second nature. Benjamin notes how, as it develops socially, humanity imagines elaborate technological utopias that are capable of removing humanity from sites of danger.

The ruling class' monopoly over technical deployment, their hellish technologies of destruction and brutish conditions of production, is evidence of a 'first technology' used ritualistically and sacrificially. Humans react to nature's overwhelming powers by attempting to master it technologically, and therefore they abuse it and themselves as natural beings. 'Second technology' is the recalibration of the relation to nature, approached through technologies that are conceived socially. Rather than a mastery of natural forces, it indicates a mastery of social forces. 'Second technology' liberates people from vulnerability in the face of nature and protects them from risk. Indeed it is developed through play, the enlightened opposite of ritual.

Art is prefigurative. It is a space in which future uses, future purposes, future scenarios can be modelled. It uses without using up, without bending towards commodity form. That is not to say this does not happen. Hito Steyerl typically puts the issue graphically and hyperbolically in 2013 in "Too Much World: Is the Internet Dead?": The context is this claim;

*The all-out internet condition is not an interface but an environment. Older media as well as imaged people, imaged structures, and image objects are embedded into networked matter. Networked space is itself a medium, or whatever one might call a medium's promiscuous, posthumous state today. It is a form of life (and death) that contains, sublates and archives all previous forms of media. In this fluid media space, images and sounds morph across different bodies and carriers, acquiring more and more glitches and bruises along the way.'*

In this environment, in this medium which contains all, in this medium in which we float – what happens?

But this space is also a sphere of liquidity, of looming rainstorms and unstable climates. It is the realm of complexity gone haywire, spinning strange feedback loops. A condition partly created by humans but also only partly controlled

by them,  
indifferent to anything but  
movement, energy, rhythm, and complica-  
tion. It is the space of the rōnin of old, the masterless  
samurai freelancers fittingly called wave men and women:  
floaters in a fleeting world of images, interns in dark net soap lands.  
We thought it was a plumbing system, so how did this tsunami creep up  
in my sink? How is this algorithm drying up this rice paddy? And how many  
workers are desperately clambering on the menacing cloud that hovers in the  
distance right now, trying to squeeze out a living, groping through a fog which may  
at any second transform into both an immersive art installation and a demonstration  
doused in cutting-edge tear gas?

Fog is both a metaphor for an unequal distribution of knowledge between self and state, for ex-  
ample, and also a technique of war, and it is an art event. It is everything and all of those things at  
once. Specifically, fog was produced by Ukichiro Nakaya. In 1944, Nakaya moved to the Nemuro  
coast to study the artificial dissipation of fog, again with military ends in sight. It is no surprise.  
Environment is investigated in the context of war, above all. If there are smoke screens as techniques  
of war, then there is a need for fog dispersal technology, as Nakaya undertook, when he carried out  
his research on sea fog in occupied Manchuria.

The US, Sweden and Japan were the first countries to use computerised weather prediction. Japa-  
nese early computing research targeted the science of weather prediction. This story of artificial  
fog re-emerges as a theme for the art world, where engineering atmosphere becomes a theme  
– art fog.

As part of this interest in air, environments, climates and so on, we might include inflat-  
able structures. These, from hot air balloons onwards, have moved between military  
applications, state-aggrandising functions, avant-garde utopian obsession. To  
make an inflatable is to participate in the engineering of atmosphere – wheth-  
er as signal of high tech mastery over nature or as sign of a proximity to  
dreaming, to utopian fantasy, to the Romantic.

A prime location of this would be the 1970 art expo  
in Osaka, Japan, where the Fuji Group  
Pavilion for Expo'70

was the  
largest air-inflated structure  
in the world. Inside this structure of com-  
pressed air and plastic, the first IMAX screen was  
debuted. Its structure was of air, so it was continuously en-  
folding on itself. It responded to every wind gust, every shift in  
atmosphere. Elsewhere in this exhibit, was the Pepsi Cola Pavilion. The  
expo, by the way, had the theme: “Progress and Harmony for Mankind”.

The Pepsi Pavilion was designed by Rauschenberg’s global initiative E.A.T (Experi-  
ments in Art and Technology). Robert Breer made some little sculptures for the Pepsi  
structure – these were called ‘Floats’. It was moved by on-board motors (at six inches per  
minute). The Floats also sometimes emitted gentle sounds (of birds singing, of sawing, or  
voices talking about a beautiful landscape). And as it did this the floats were immersed in arti-  
ficial fog. Indeed, on approaching the Pepsi Pavilion, a vale of fog shrouded the whole origami-  
like structure. Fujiko Nakaya was the artist in charge of this fog skin – she was the daughter of the  
man who created the first artificial snow crystal in the context of military research.

How is it that the aesthetic use of fog parallels instrumental scientific uses? The system of artificial  
fog production has an afterlife. An updated version is now used as a means of air conditioning at  
data centres, where issues of temperature control are so key. Facebook’s data centre at Prineville  
in Oregon has developed an artificial fog system to keep data cool. Data centres: These are the  
material infrastructures that sustain surveillance capitalism, predict behaviours, from con-  
sumption to pre-crime. Fog is a metaphor – for being lost in the world.

But then that very property of fog as confusing becomes operative, used as smokescreens,  
or overcomable, as dispersion technologies are invented. And then the fog is militarised  
– linked into a science and technology of environment that serves military ends. But  
it is also made aesthetic, mobilised for art, sometimes in a transmission that is bio-  
graphical, very direct. And if fog is an image for us being without bearings,  
lost in our contemporary environments in which left and right are con-  
fused, difficult to map, and technology confuses us, and politics  
seems from another space, then is it not also the case that the  
fog – in the fogged computers, in the fog systems,  
is also precisely about a certain locating  
in time and space, a very

specific  
one? We are trackable.

If an artist steps into the field of art and technology, this is the messy field, the force field, the field of relations, into which they step. You really need to know how to use it without it using you.

Esther, I wanted to ask what you think about the glazed ceramics I've been working on. I am collecting refuse of Gorilla Glass used in Iphones and other types of glass from computer screens, which I mill or crush to use as glass former in glazes, instead of silica or frits. Gorilla Glass is branded as resistant and unbreakable but screens shatter over and over. Yet, Gorilla Glass, and other types of glass used in LCD screens, can be melted with the right flux at the right temperature.

Before images were transmitted by software and, or, emulsions, they were transmitted via transferware and China paintings over dishware made of earthenware, stoneware, porcelain. When I fired this glaze, which I called 'LCD Glaze', tiny glass marbles formed on the surface if the glass was not crushed enough. Gorilla Glass finally freezes into screenware. To me this recycled screen waste is the synthesis of the technological and the ecological sublime you identified in 'Liquid Crystals', one that 'tends towards trash – your hopes, your dreams, our hopes and dreams', to use your words.

Screens squared is a way of tackling the screen, to be sure, ramping it up, amplifying it and making out of it an emblem of now. An act of violence – its grinding up – to be used as a recycled material, delicately calibrating the heat and the co-constituents, in the manner of an alchemist, in order to coax something unexpected from the melange. It intrigues me that these screens have attracted the rare act of smashing or defiling.

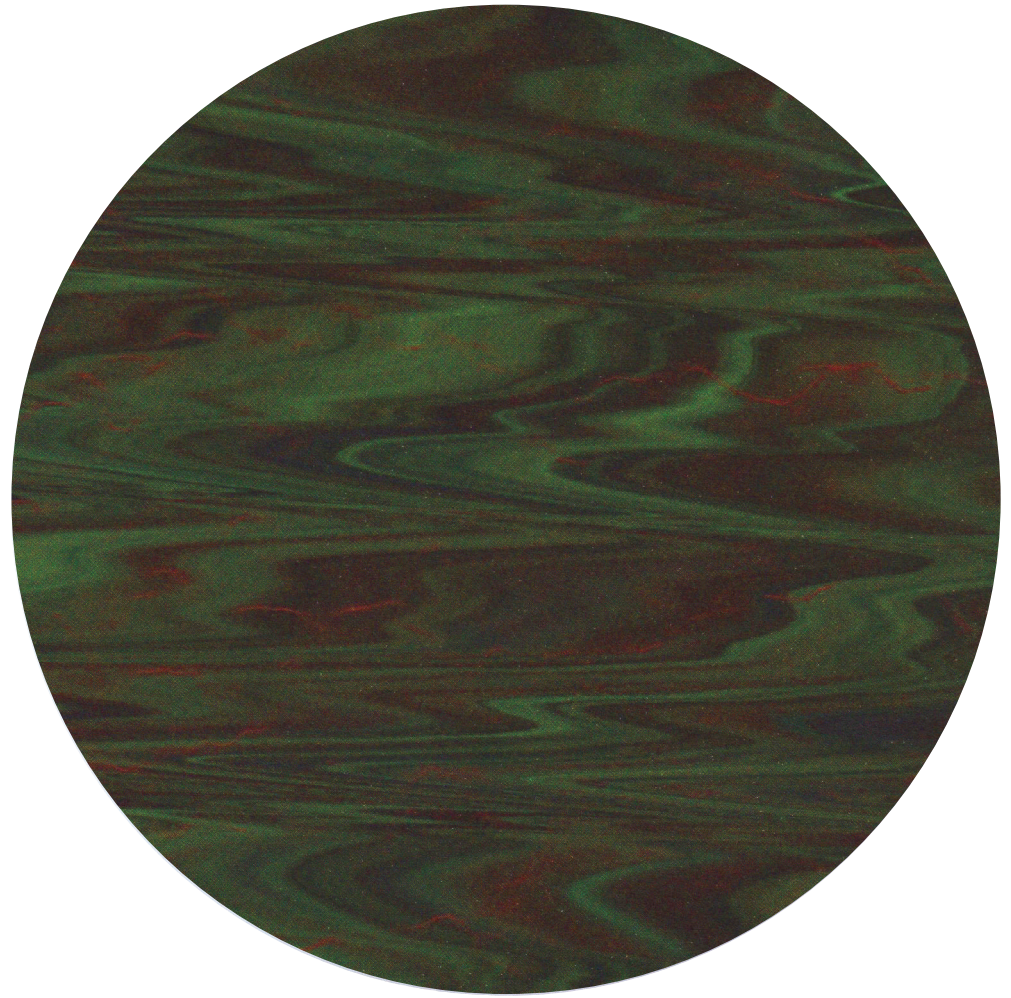
For the smartphone users, it is all about preventing the smash, insulating the device, like a precious thing, even though it is also a thing that is constantly made greasy by fingers and is depreciating from the moment it is put into use.

Other smashers have taken a certain beauty out of the random patterns produced by broken glass, or by the

disarray  
of the liquid crystal patterns  
once the top layers are broken up. But grinding the glass, firing it, melting it – heating the crystalline layer that covers the liquid crystals, its portal, into liquid states and then letting it harden in a new crystal form, is ingenious, as well as producing something of an uncommon beauty.

We – artists – can make new values, lovers' values, the value that comes to something through making it your own and then giving it out to the world. Creamware becomes Queenware becomes Screenware.

Screens are complex things – barriers, portals, protective, defensive, porous, impermeable, to be seen, to prevent seeing, identificatory, substitutable. It is only right that they now come into a certain expression, a relation with heat and ceramics that can be managed but never fully controlled. There will be so many of them littering the world – already are – I am sure it will not be the last of their transformations, but it is exhilarating to be one of the first.





## **LCD GLAZE**

LCD Glaze is a glossy, transparent and crackled glaze for earthenware clay bodies that use waste from computer screens as glass former instead of silica or frits.

To prepare the glaze you need a broken or obsolete computer screen. Heat up the screen with a heat gun to make it easier to separate the film from the glass panel. You can use an exacto knife to peel away all the film. Use alcohol to clean the glass pieces from any remaining glue.

Ball mill the glass pieces until they are reduced to a fine powder. This process takes around 2 hours. Run the powder through a fine sieve screen. A finer powder makes a better glaze.

Cone 04 to 05

For a glossy, transparent and crackled finish:

60 LCD glaze  
40 Gerstley Borate

100 Total

+ 2–5% commercial colour stains

Mix with water to achieve a slushy consistency and bring out the cracks.

Firing: 1060°C max on a computer controlled electric kiln.

For a pearly finish:

20 LCD glaze

80 Gerstley Borate

100 Total

Mix with water to achieve a creamy consistency and bring out a pearled surface.

Firing: 1060°C max on a computer controlled electric kiln.

\* Respirator, gloves and protective glasses extremely recommended. The liquid in between the film and the screen has a very intense smell, the glass is sharp and little particles can easily get inside your eyes.

## **GORILLA GLAZE**

Gorilla Glaze is a runny, glossy, smooth and reflective glaze for stoneware clay bodies that use waste from smartphones screens as glass former instead of silica or frits. At earthenware temperatures creates mesmerizing pearls and bubbles. Gorilla Glass is a type of tempered glass developed by Corning and found in 5 billion devices worldwide according to Wikipedia.

To prepare the glaze you need a broken or obsolete smartphone screen. You can find information online to check if your screen is made with Gorilla Glass®. I used a broken Iphone screen.

Heat up the screen with a heat gun to make it easier to separate the film from the glass panel. You can use an exacto knife to peel away all the film. Use alcohol to clean the glass pieces from any remaining glue.

Ball mill the glass pieces to reduce them to a fine powder. This process takes around 2 hours. Run the powder through a fine sieve screen. A finer powder achieves a better glaze.

Cone 4 to 6:

For runny, glossy, transparent and smooth finish:

40 Gorilla glaze  
50 Colemanite  
10 Gerstley Borate

100 Total

+ 5% commercial black stain for black *claude glass* surface.

Mix with water to achieve a thick butter.

Firing: 1220°C max on a computer controlled electric kiln.

For bubbles and marbles:

To make bubbles and marbles in the surface just crush the Gorilla glass pieces into the size of a rough sea salt grain and fire at low temperature.

Mix little pieces of crushed Gorilla glass with a pinch of Gerstley Borate and a few drops of water.

Create a small cumulus in the surface area where you want the effect.

You can also sprinkle the pieces on the surface and add buttery Gerstley Borate on the top.

Firing: 1050°C on a computer controlled electric kiln.

It is possible to make the Gorilla Glaze run at earthenware temperatures by experimenting with the time curves and the amount of flux. Holding 20 mins at the end of the curve helps to pull out the magic trick.

\* Respirator, gloves and protective glasses extremely recommended. The liquid in between the film and the screen has a very intense smell, the glass is sharp and little particles can easily get inside your eyes.



Flux until sunrise, 2018  
Gorilla glaze and  
commercial black stain.  
Stoneware  
Dimensions variable

The sun is up, 2018  
LCD and Gorilla glaze  
and commercial colour  
stains.  
Earthenware  
20 cm diameter



Claude Iceberg, 2018  
LCD and Gorilla glaze  
and commercial black  
stain.  
Earthenware  
20 cm diameter

Magic hour, 2018  
LCD and Gorilla glaze  
and commercial colour  
stains.  
Earthenware  
20 cm diameter



*Flux until sunrise* it is a special round object and my first book documenting my work with screen waste and ceramic glazes. I made this for you, but art is never an individual endeavour. There is no such thing as solo art or solo shows, neither solo books. I am grateful to Esther Leslie, for her work, which constantly inspires me, and for the generous, thoughtful, time to my questions. Olle Essvik and Joel Nordqvist from Rojal for their editorial work and binding this hand-made book. Hannah Björkdahl and Karin Granlöv for sharing their knowledge on ceramic glazes with me. The ceramics department of HDK - Academy of Arts and Design, for a wonderful learning space. Mia Branzell and Anna Eggert for their mentorship on glass techniques. And Michel Walther and Magnus Eriksson for supporting and encouraging me when the sun is up.

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