

**C musée
A d'art con
P
C de Borde**

***4.543 billion.
The matter of matter***

**29 June 2017–
7 January 2018**

Curated by Latitudes

RENEW ADELAIDE?
 GUERRILLA GARDENING
 UNDERGROUND CINEMA
 AUSSIE TROUBLEMAKING HISTORY
 ARCHIVING ZINES
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 COMICS
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UNDER

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 UNDOCUMENTED LABOUR
 THE CIVIL WAR UNDERGROUND RAILROAD
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 DOLE ARMY

GROUND

HOBBYISTS + AMATEURS
 URANIUM
 CROCHET AND KNITTING
 HOW TO BE HAPPY
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 THOSE WHO QUIT AND NEVER CAME BACK
 PAGE LIMITS, DEADLINES & BUDGET CONSTRAINTS
 "OUTSIDER ART"
 CENSORED MATERIALS
 WORMS
 DROPPING OUT
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 THE HONBLE DAIKON
 WHAT THE YOUNG PEOPLE ARE UP TO THESE DAYS
 F.T.M. TRANS
 E-WASTE
 UNACKNOWLEDGED ANXIETIES
 HOW CATS THINK
 THE ATLANTIC TELEGRAPH CABLE
 "DAGGERING"
 THE FUTURE
 FILESHARING
 RATS
 "DAVE HARRIS"
 CRIME
 HOME PAGES FROM 1995
 GRAFFITI
 THE WELL IN MURAKAMI'S "WIND UP BIRD CHRONICLE"
 DREAMS
 "NOSIN' AROUND"
 DESIRE SUPPRESSION + OTHER FREUDIAN-TYPE THINGS
 UGLY NUGGETS
 CARBON SEQUESTATION
 IRRIGATION/SEWERAGE TECHNOLOGIES
 CONSPIRACY THEORIES
 JAPANESE SUBWAY GAS ATTACKS
 THE WOMBLES
 CRAIG BALDWIN
 JULES VERNE'S "JOURNEY TO THE CENTRE OF THE EARTH"
 LIGHTNING RIDGE + COOPER PEDI
 ETC.

AMNESIA
 "6 FEET UNDER"
 WHAT GOES ON IN NORTH KOREA

4.543 billion. The matter of matter
29 June 2017–7 January 2018
Curated by Latitudes

With contributions from more than 30 artists, *4.543 billion. The matter of matter* is an exhibition that addresses works of art, collections and cultural histories in relation to ecological processes and a geological scale of time. It presents a continuum of materials and temporal landscapes—films, works on paper, photographs, sculptures, documents, and other meaningful things—and springs from the CAPC building's former life as a warehouse for colonial commodities whose limestone walls were once deep in the ground and whose wooden beams were once part of a forest.

A central proposal of the exhibition is that works of art are part of geophysical history as much as art history. *4.543 billion* attempts to take into account both a micro-local and a planetary perspective, and to rethink some of the histories of art as fragments of broader narratives about the Earth and how our place in it has been represented. What is at stake when art and museums take on greater temporal and material awareness? How might they move beyond a spatial framework of 'think globally, act locally', to 'think historically, act geologically'?

This exhibition takes a situated view of the past that resists an undifferentiated narrative in which modernity in general is at fault for global ecological disarray, or humanity in an invariably abstract sense must take responsibility. Accordingly, the artists included instead often address the specific roles and purposeful effects of individuals, practices, states or corporations in an account of how mineral agents and organic processes have intertwined with and underpinned culture. Several of the more documentary projects on display trace the relationships between Modern art, the museum, and wealth created through extractive industry, combining approaches framed by Earth sciences with colonial history, sociology and political reportage. Yet other works take a more atmospheric, filmic, sculptural or graphic approach to extraction, economy, energy and global exchange, whether orbiting around sunlight, forests, synthetic materials derived from fossil fuels, or the services and substances entailed in buildings that display art.

4.543 billion is part of the cultural season *Paysages Bordeaux 2017*. Within its framework, Latitudes will lead the month-long residency programme *Geologic Time* at Banff Centre for Arts and Creativity, Alberta, Canada, in the autumn of 2017.

Entrance

Hubert Duprat

Nérac, Lot-et-Garonne, 1957. Lives in the south of France.

Cassé-Collé [Broken-Glued] (1992) consists of a pink sandstone boulder, weighing over half a tonne, that the artist had split apart into several pieces before it was stuck back together again in a deliberately inexact way. This process of fracturing and recomposition alludes to an aspect of the work of the eminent archaeologist François Daleau (1845–1927), who spent his life working around the Gironde region and whose many finds are now part of the collections of the Musée d'Aquitaine and the Muséum d'histoire naturelle de Bordeaux. Led by his interest in prehistoric tools and how stones would have been shaped by early humans, Daleau created a number of composite lithic objects by gluing together shards of flint.

Left Galleries, Gallery 1

Félix Arnaudin

Labouheyre, Landes, 1844–1924.

In the wake of the French Revolution, and with pressure for the production of naval timber, French forests were undergoing a profound reorganization. Further transformations came with the colonial vision that 'harmful' marshy or desertlike climates should be 'improved' through tree-planting. The ancestral moorland landscape of the Landes de Gascogne to the southwest of Bordeaux and its traditional pastoral ways of life would be forever changed. A 1857 law definitively accelerated the forestation and privatization of the Landes, leading to the emergence of a managed modern sylvan economy based on timber, the extraction of resin for turpentine and varnish, as well as the production of charcoal and pitch.

From c.1874 until his death, Félix Arnaudin dedicated himself to documenting the political ecology of the Landes. Arnaudin was disgusted by the industrialisation of this flat topography through pine forest plantations and intensive agricultural cultivation and was disturbed by the drastic social and ecological transformations that he witnessed. His camera documented the shepherds whose sheep still seasonally grazed the dwindling open communal land. He recorded the native oak, chestnut and pine groves, but especially, and repeatedly, the wide vistas of the few areas of heath that had not been encroached upon by the homogenous new trees.

Construction of a warehouse and jetty. Statement of works

The building that has hosted the CAPC since 1974 was masterminded by the engineer and architect Claude Deschamps (1765–1843). The Entrepôt Lainé [Lainé Warehouse], also referred to as the *Entrepôt réel des denrées coloniales*, was completed in twenty-one months of work between 1822 and 1824. The strata of this folio document every hour worked by the construction labourers, record each block of stone that makes up the walls of the warehouse, detail each of its timber beams, and index each batch of the clay bricks that comprise its arches. The stone of the building is the characteristic Bordeaux *calcaire à astéries* [asteriated limestone] and would have been brought from the quarries around Bourg, north of the city. The timber was likely shipped from northern Germany or the boreal forests of the Baltic region and is probably a species of spruce or pine.

The engineering of Deschamps connects the Entrepôt Lainé with the Landes de Gascogne to the southwest of Bordeaux, and the photographs of Félix Arnaudin that can also be seen in this gallery. From around 1810, Deschamps was devoted to a plan to transform the vast heathlands of the Landes—that he considered to be an ugly, depressing and unproductive void. Deschamps spent decades trying to realize his ambitious and ultimately unrealized scheme for a Grandes Landes Canal between Bordeaux and Bayonne that he envisaged opening up rehabilitated moors to the transport of timber from pine plantations and produce from new arable land.

Alexander Whalley Light

United Kingdom, c.1752-1812–Oxford, Nova Scotia, 1856.

The industrial revolution arose in a world already capitalized and globalized through European entry into the world of the Americas and the rise of transatlantic trade, slavery and the plantation system. Portuguese, British, French, Spanish, and Dutch merchants vied for domination of the Atlantic trading space and a system in which slave-produced crops grown on millions of ‘ghost hectares’ could release exhausted domestic soils from the constraints of production. Cocoa, tobacco, cotton, sugarcane, coffee and indigo were among the first experiments in tropical agriculture.

This 1820 lithograph is made after a c.1814 pen-and-ink drawing by Alexander Whalley Light, a Lieutenant Colonel in the British Army. It shows coffee plantations seen from the residence of the governor of Guadeloupe, then under British control.

Tables of the movement of the merchandise of the réel warehouse place Lainé, rue Vauban and annexe Vauban

Bordeaux's prosperity throughout the eighteenth century grew as the direct result of increased transatlantic trading. A large array of products were directly imported from the French West Indies—from Martinique and Guadeloupe, but overwhelmingly Saint-Domingue (present-day Haiti). Colonial cash crops from slave-run plantations were shipped to Bordeaux warehouses before re-export across northern Europe, especially the Baltic states, along with agricultural goods from the fertile Bordeaux hinterland, not least wine. Yet by the time of the construction of the Entrepôt Lainé, the raw materials stored and traded in the building would have been a cornucopia of truly global origin and variety—indigo from Bengal, vanilla from Réunion, raffia from China, elephant tusks from Cape Town, and so on. Each product would have been weighed and tarified according to its origin. The building could store more than 15,000 tonnes of goods at any one time.

Ambroise-Louis Garneray
Paris, 1783–1857.

The building of the Entrepôt Lainé was commissioned by the Bordeaux Chamber of Commerce to consolidate the different storage facilities dispersed along the river into a single vast central depot under the auspices of the city customs. In this 1830 aquatint, Ambroise-Louis Garneray depicts the busy Bordeaux quayside in front of the warehouse, which then directly faced the Garonne river—since 1925 this view has been blocked by the Bourse Maritime (Maritime Exchange) building.

Between Gallery 1 & 2

Coffee beans found in the galleries and offices of the CAPC

Following the Dutch, France was the second state to start colonial coffee production, in 1715, after seedlings were brought from Yemen to Réunion, then governed by the French East India company. For almost two centuries, European bourgeois society, slavery, plantations and coffee were inextricably linked. Global production surged as plantations spread to the Americas, and by the 1770s, French-produced coffee from Saint-Domingue had replaced its Yemeni competitor in the Ottoman market of Cairo, where it was cheaper, despite having to cross the Atlantic and the Mediterranean. After the independence of Brazil in 1822, its coffee production grew

on an unprecedented scale and it would have dominated the global market during the heyday of the Entrepôt Lainé.

At the CAPC, coffee beans occasionally materialize, as if out of nowhere. One day one might appear atop a pile of papers on an office desk; months later, a couple might show up in the middle of one of the exhibition galleries. François Poisay from the museum's exhibition team has been squirreling away these nuggets of the past in his desk for years. Hundreds of thousands of sacks of coffee would have come through the Entrepôt Lainé. Clearly several beans were spilled over the decades, and they found their way into the nooks and crevices of the wooden floorboards and beams, only to emerge again years later.

Gallery 2

Étienne Denisse

Carcassonne, 1785–Bordeaux, 1861.

Étienne Denisse was a botanist and illustrator who was contracted by the government of Guadeloupe to illustrate the plants of the French Antilles and to research their medical, culinary, toxic or aesthetic properties. This facsimile of a hand-coloured lithograph predates *Flore d'Amérique*, Denisse's magnum opus of 1843, which comprised 201 plates. It represents the tropical evergreen tree *Theobroma cacao*—whose seeds are the origin of chocolate. The French established cacao plantations on the colonies of Martinique, Saint Lucia and Guadeloupe as early as the 1660s.

The illustration is taken from an 1835 fascicle entitled *Flore générale d'Amérique* that was dedicated to the Linnean Society of Bordeaux, the learned society established in 1818 that is still active in the city. The society takes its name from Carl Linnaeus (1707–78) the botanist whose vast taxonomical exercise and establishment of conventions for the hierarchical naming of organisms revolutionized world ecology.

Anne Garde

Libourne, Gironde, 1946. Lives in Paris.

Following extensive renovations, the CAPC reopened in June 1990 with an exhibition in the nave of the Entrepôt Lainé by the American sculptor Richard Serra. The photographer Anne Garde documented not only the process of installation of the three huge slabs of weatherproof steel that comprised *Threats of Hell* (1990), but the



Félix Arnaud, *Charcoal making at Baxourdes with Cazade and Vidal, 25 steps East*, 14 June 1885
Collection Musée d'Aquitaine, Bordeaux.

Rayane Tabet, *Three Logos*, 2013
Courtesy the artist and Sfeir Semler Gallery, Hamburg/Beirut.

production of the work at Dillinger Hütte in Dillingen, Germany, a steelworks with unusually large heavy-plate rolling-mills. The three steel slabs (each weighing 43 tonnes) were later reconfigured for a private collection as the work *Hopes of Paradise* (1990) and are presently installed in a garden on the banks of the Garonne. Rather than focussing on Serra the artist, or the monumental nature of the finished sculpture, this selection of Garde's photographs highlights the material transformations involved in the fabrication of the slabs and the almost archaeological proceedings in the nave.

Martín Llavaneras

Lleida, Catalonia, 1983. Lives in Barcelona.

Lithography is a printing technique discovered around 1796 by the Bavarian playwright Alois Senefelder (1771–1834) as an alternative to costly copperplate engraving. Its name derives from the Latin for stone, *litho*, and mark, *graph*. After drawing with greasy crayon on the surface of the local smooth limestone, Senefelder found that images could be repeatedly inked and printed on paper. Later refinements of the technique led to a broad range of possibilities for reproducing commercial and artistic images, and the development of offset printing. It is no coincidence that all known fossil specimens of the early bird *Archaeopteryx lithographica* have been found in Senefelder's Bavaria—the exceptionally fine limestone mined for lithographic printing also preserved highly detailed imprints of Jurassic life.

Touchpad (2016) comprises a dozen stone slabs once used for lithography. As printing houses closed or upgraded their presses, many slabs were discarded and were often used as paving. Tracing this history of obsolescence from inky images to ghostly footprints, Martín Llavaneras is interested in these surfaces as lithic tactile interfaces.

Alessandro Balteo-Yazbeck in collaboration with Media Farzin

Caracas, 1972. Lives in Berlin; San Diego, 1979. Lives in New York.

Four works in the exhibition by artist Alessandro Balteo-Yazbeck and art historian Media Farzin are parts of two series entitled "Modern Entanglements, U.S. Interventions" (2006–9) and "Cultural Diplomacy: An Art We Neglect" (2007–9). They deal with the interpenetration of art history in the global politics of petroleum and conflict, and vice versa. Each incorporates its own wall label texts as an integral part of the work, juxtaposing factual evidence with quotations to suggest what are sometimes

deliberately tenuous connections between the sculptures of Alexander Calder (1898–1976), Venezuelan and American oil interests, the Cold War, the Museum of Modern Art in New York, and its trustee from 1932 to 1979, the businessman and politician Nelson Rockefeller (1908–1979).

Rayyane Tabet

Ashqout, Lebanon, 1983. Lives in Beirut.

The Trans-Arabian Pipe Line (also known as the Tapline) was conceived by American companies as a faster, cheaper, and safer alternative to the export of Saudi Arabian oil by ship around the Arabian Peninsula. Its origins lay in US-government coordinated efforts to replace the enormous drain on American reserves in 'oiling' the second world war. The Tapline was constructed between 1947 and 1950 as a joint venture of Standard Oil of New Jersey, the Socony-Vacuum Oil Company (both now merged into ExxonMobil), the Texas Company, and Standard Oil of California (now Texaco and its parent company Chevron, respectively). The pipeline was planned to run in a direct line from the Abqaiq oil field to Haifa, then in British-administered Palestine. Yet as the disputed 1947 United Nations Partition Plan divided Palestine into Arab and Israeli sections, a diversion had to be made in the route. The final stretch of the 1214 km line thus headed off at an angle through Jordan and Syria, and terminated in southern Lebanon. Oil exports flowed from 1950 until the Lebanese Civil War broke out in 1975. The Tapline later supplied oil exclusively to Jordan until Saudi Arabia stopped the agreement in 1990 in response to Jordanian support for Iraq during the first Gulf War. The pipeline has lain dormant ever since.

Crossing galleries 2 and 3, Rayyane Tabet's *Steel Rings* (2013) addresses the pipeline as a form of line drawing. The artist distilled his exhaustive research into the history of the Tapline to focus on the abstract and geometric qualities of what was a remarkable feat of engineering and logistics. Tabet's primary interest lies in the Tapline's route as a cartographic vector, and the physical presence of a tube of steel that slices through five political entities. The steel rings replicate the scale of the pipeline in section. Each ring is engraved with the longitude, latitude and elevation corresponding to a kilometre-marker of the pipeline's path. *Three Logos* (2013) evokes the numerous mergers and rebrandings of the American corporations involved. The blue oval of the Esso logo (originally a brand of Standard Oil), intertwines with the red star of Texaco and the winged horse of Mobil.

Gallery 3

Amie Siegel

Chicago, 1974. Lives in New York City.

Amie Siegel's three-part work *Dynasty* (2017) centres on a pinkish-brown marble quarried in northern Italy that is commonly known as Breccia Pernice. Two 1:1 scale photographic prints of glossy slabs represent the marble's crystalline composition with great veracity and uncanny precision. Siegel has observed the use of polished metamorphic rock as a status symbol in luxury interiors and real estate in Manhattan, and its symbolic aspirations to affluence and opulence. In *Dynasty* she mines what is Breccia Pernice's most notorious application—in the flamboyant lobby of Trump Tower, the skyscraper built in 1983 on New York City's Fifth Avenue by Donald J. Trump, President of the U.S. since January 2017. An image depicts a trench in the floor of this burnished headquarters of commercial and political power. A fragment of marble from the lobby itself is presented as if a talismanic object, a lump of matter once formed through immense metamorphic shock and now charged with planetary disquiet about the future.

Terence Gower

Vernon, British Columbia, 1965.

Lives in New York City and Nièvre, France.

Wilderness Utopia and *Public Spirit* (both 2008) tell the story of the interplay between uranium and urbanism, money and modern art in 1950s Canada. Latvian-born mineral prospector Joseph H. Hirshhorn (1899–1981) used his uranium mining fortune to amass one of the world's largest private collections of art, which later formed the basis for the opening, in 1974, of the museum and sculpture garden that bears his name on the National Mall, Washington, D.C. Terence Gower's display-case installation and fictional promotional video were first exhibited as elements of a commission at the same Hirshhorn Museum in 2008. Yet long before the Washington museum was founded, Hirshhorn dreamt of a utopian community in Ontario that would integrate a permanent home for his art collection alongside his new uranium mine, its offices and worker-housing. In 1955, Hirshhorn hired the architect Philip Johnson (1906–2005) to develop plans, yet the project never came to fruition.

Erlea Maneros Zabala

Bilbao, 1979. Lives between Lekeitio, Basque Country and Joshua Tree, California.

For her series “Pilgrimages for a New Economy” (2007–12) Erlea Maneros Zabala photographed the uncanny presence of several well-known art museums as seen—sometimes obliquely—through the pixels, dirt and fingerprints of computer and tablet displays. The image of these cultural facilities is shorn of the polished conventions of architectural photography. Trophy museums, as well as the fetishistic surfaces of electronics, appear as resolutely grubby accumulations of materials marked by bodily traces as well as by dust, synonymous with disintegration and neglect. Maneros Zabala’s photographs seem to suggest a series of cleavages between the image, form, utility and material history of art museums especially whenever a camera-friendly building is designed to put a ‘gritty’ city ‘on the map’ and encourage investment.

The opening in 1997 of the Frank Gehry-designed branch of the Guggenheim in Maneros Zabala’s native city of Bilbao is frequently cited as a prototype for urban regeneration through contemporary art. Yet “Pilgrimages for a New Economy” connects a broad range of architecture, economies and substances, including the 2011 Soumaya Museum in Mexico City, funded by the telecoms magnate Carlos Slim, and the 2005 extension of the Walker Art Center in Minneapolis, Minnesota, founded in 1879 by the timber baron Thomas Barlow Walker (1840–1928).

Between Gallery 3 & 4

Limestone, formerly part of White Rock Line (1990) by Richard Long

White Rock Line is an artwork by the British sculptor Richard Long that was commissioned on the occasion of the renovations of the CAPC in 1990. Sited permanently on the museum’s roof terrace, the work comprises a 40-metre long, 1.5-metre wide rectangle of pale micritic and bioclastic Turonian limestone fragments. The stone was sourced from the Malville quarry near the town of La Tour-Blanche in the Dordogne département, a site owned by a company that specialises in cement, construction aggregates, and concrete.

By 2014, *White Rock Line* had turned a dull cinereous colour due to general airborne dirt combined with algal growth and pollen. With the artist’s consent, it was decided to replace the stones with fresh white ones. The greyed stones were retrieved by Lafarge and later

used for road foundations. Yet the CAPC head of collection Anne Cadenet kept one of the old fragments on a bookshelf in her office as a memento. No longer art, this decommissioned stone has gone back to being 'merely' geological matter, between 89.8–93.9 million years old.

Gallery 4

Limestone core samples from the feasibility study for a Bordeaux underground metro system

Geological core samples arrive with a specific history and an inherently archival metaphor. Obtained by drilling into the ground with a special cutter, they are neither raw rock, nor stone that has been carved by a sculptor or mason. Borrowed from the University of Bordeaux's lithoteque, a museum of strata of the Aquitaine Basin, this limestone core is composed of the characteristically soft *Calcaire à Astéries* (asteriated limestone) and was formed 33.9 million years to 23 million years ago. This is the same stone that has been used extensively throughout Bordeaux (as well as in Libourne and Saint-Émilion) for the construction of monuments, façades and buildings, including the Entrepôt Lainé itself. As evidenced by some of the older houses of the city, it is fragile and easily friable. Underground too it is subject to erosion and the stone's numerous cavities, fissures and faults have led to a rather unstable subsoil.

In the late 1980s and early 1990s, the Bordeaux Métropole studied the possibility of building an underground metro system like the Lille VAL (Véhicule Automatique Léger) system to alleviate the city's often gridlocked roads. As the cost of the proposed network spiralled, geological studies confirmed that the crumbly nature of the limestone would in any case pose innumerable risks for creating and maintaining structurally-sound tunnels. By 1996 the underground transit option had been discarded and the green light given to the overground Tramway de Bordeaux, whose first line opened in 2003.

Xavier Ribas
Barcelona, 1960. Lives in London.

A History of Detonations (2014) is a glimpse at an extensive body of work by Xavier Ribas devoted to exploring the legacy of the mining of sodium nitrate in northern Chile, which boomed from the 1870s until the early-twentieth century, when it was discovered how to make the compound synthetically. Comprised of photographs taken



Terence Gower, *Wilderness Utopia*, 2008
Courtesy the artist and LABOR, Mexico City.

Alexandra Navratil, *Modern Magic*, 2013
Courtesy the artist and Dan Gunn, Berlin.

by the artist during research visits, alongside vintage postcards and press prints bought on the internet, Ribas's poster sequence takes us from Chile to London to the surface of Mars. The mining and trade of Chilean sodium nitrate was led by a class of British 'gentleman capitalists'—aristocrats, bankers and merchants. The extraction of the resource not only industrialized the arid Atacama Desert at one end of the commodity chain, and enriched country estates at the other, but through its use as a chemical fertilizer and a component of explosives, it would radically alter a whole series of seemingly disparate geographies, bodies and institutions.

Ilana Halperin

New York City, 1973. Lives in Glasgow.

To see, touch, and hear the elements of Ilana Halperin's work that are located at the CAPC, please ask the gallery attendant in this room. A second part of the work is an off-site intervention at the zoology collection of the University of Bordeaux (by guided visit only, please see the schedule below).

Halperin's new project for *4.543 billion*, entitled *The Rock Cycle* (2016–7), deals with geological intimacy and vivacity, and the uncanny fact that something as apparently inert and certain as the stone walls of the CAPC building were once marine life from a tropical ocean of the Oligocene epoch, around 32 million-years ago. This *Calcaire à Astéries* (asteriated limestone) characteristic of Bordeaux takes its name from the countless tiny fossil organisms of the genus *asterias* (a type of sea star) that can be found in the stone alongside fossil molluscs and coral.

Halperin addresses stone, not as dead matter or a mere resource, but as a story-laden substance that both surpasses and partners in humans' view of the world. *The Rock Cycle* incorporates the reading of a letter, and the hosting of a number of the artist's geological sculptures within the displays of the zoology collection of the University of Bordeaux. These 'curios' originated as fragments of sea-weathered brick from the Isle of Bute in western Scotland, as well as waterjet-cut sandstone, that the artist left for three months in Fontaines Pétrifiantes in Saint-Nectaire. For generations the mineral-rich waters that percolate through the rock at this site in central France have been used to create sculptures using the same process by which stalactites form, only one hundred times faster. Objects become rapidly encrusted with new layers of stone.

Schedule of guided visits to *The Rock Cycle* at the University of Bordeaux. By prior reservation: l.correa@mairie-bordeaux.fr or tel: +33 (0)5 56 00 81 60
Rendez-vous: 2:00pm at the exhibition entrance at the CAPC.

Friday 30 June 2017
Thursday 19 October 2017
Thursday 16 November 2017
Thursday 14 December 2017
Thursday 4 January 2018

Lucy Skaer
Cambridge, United Kingdom, 1975. Lives in Glasgow.

Black Alphabet (2008) comprises twenty-six identical stealth missile-like forms manufactured from coal, the carboniferous matter that became a cheap fuel in the nineteenth century, dethroning peat and charcoal to reshape planetary life and industrial capitalism before the rise of oil. These sinister black objects are based on the twenty-six versions of the sculpture *Bird in Space* that the Romanian-born artist Constantin Brâncuși (1876–1957) made in marble, bronze and plaster between 1926 and the 1940s. An expression of flight and transcendence of the material world, *Bird in Space* was the subject of a landmark court case between Brâncuși and the US Customs after it was taxed as a utilitarian object (under 'Kitchen Utensils and Hospital Supplies') on its importation into the US from France in 1926. Officials refused to classify it as a work of art and therefore exempt it from import duties. Ultimately the court found in favour of Brâncuși as it accepted that the legal definition of sculptures as being only representations of natural objects was out of date.

Jannis Kounellis
Piraeus, Attica, 1936–Rome, 2017.

An imposing work comprised of humble materials, Jannis Kounellis's *Sans titre* [Untitled] (1985) bookends the exhibition at its southernmost point. It was first shown as part of a large-scale exhibition of the artist's work at the CAPC in 1985. A series of fused steel panels are perforated by seven copper gas pipes that continuously throw live flames, while Hessian sacks once used for cacao seeds are draped over the top. Kounellis's work speaks of *longue durée* movements of power, commodity production and exchange forged across the great expansions of the nineteenth and twentieth centuries—history violently formed through a

fundamental reordering of the relations between humans and the rest of nature with regards to food, labour, energy and raw materials. The cacao sacks that hang over the panels were sourced for the original exhibition from Touton, a Bordeaux-based company that has been a major player in cocoa production and trade (as well as that of coffee, vanilla, and spices) since the mid-nineteenth century. To conform to today's safety norms, the work has been adapted to run from the building's mains gas system rather than bottled propane.

Between Gallery 2 & 5

Partially-burnt documents rescued from fire at the Bordeaux municipal archives, then housed at the Hôtel de ville, Palais Rohan

Fire gutted Bordeaux's Hôtel de ville on the night of 13 June 1862. The Palais Rohan building was then the home of the city's municipal archives and it suffered a devastating loss of medieval and *ancien régime* documents, as well as of works of art. In a desperate bid to salvage the historical record, many paper documents were doused with water and thrown out of the windows where they were piled on the grass.

Gallery 5

Alexandra Navratil
Zürich, 1978. Lives in Amsterdam.

Modern Magic (2013) is part of a series of works by Alexandra Navratil investigating the early history of industrial chemistry, the technology of colour in photography and the synthesis of consumer culture. Two sequences of projected 35mm slides show photographs taken for issues of the American trade magazine *Modern Plastics* between the years 1930 and 1970. We see all manner of plastic objects and samples being held or manipulated by human hands to demonstrate the characteristics of this novel class of matter.

Plastics are derived from petroleum. Spurred by excess industrial capacity following the oil-thirsty second world war, the petrochemical sector turned to civilian inventions, and created a new realm of versatile materials and dazzling consumer goods. Yet the origins of these synthetic worlds go back to nineteenth-century Germany and another underground carbon derivative—coal. With few colonies to exploit and few natural resources except

its coal fields, German chemists set about creating surrogates and substitutes for natural substances. BASF began producing coal-tar dyes in the 1860s, and the invention of synthetic rubber, tortoiseshell, ivory, and fibre took hold throughout the early 1900s.

Fiona Marron

County Monaghan, 1987. Lives in Dublin.

The mine holds a powerful place in the imagination—a frontier site where human labour converges with the appropriation of ‘free’ geological value, created over millions of years. Fiona Marron’s *All surface expectations disappear with depth* (2010) revolves around the mining of gypsum and zinc, yet moreover, the people and relationships involved in the labour of bringing these substances to the Earth’s surface. Her three-part video installation features extracts from a celebrated 1954 study of a gypsum mine by the sociologist Alvin Ward Gouldner (1920–1980). Gouldner’s fieldwork hinged on the bureaucracy of the mine—especially the relations between the workers toiling in frequently dangerous conditions underground and the mine management with its offices on the surface. Marron juxtaposes text from the study with often-clamorous footage filmed at a zinc mining operation in County Tipperary, Ireland (which has since ceased operations) and a static shot of a present-day gypsum mine near where the artist grew up in County Monaghan. Zinc is most commonly used as an anti-corrosion agent, while gypsum board, also known as drywall or plasterboard, is a building material that is often used to create temporary walls in exhibitions.

Right Galleries, Gallery 6

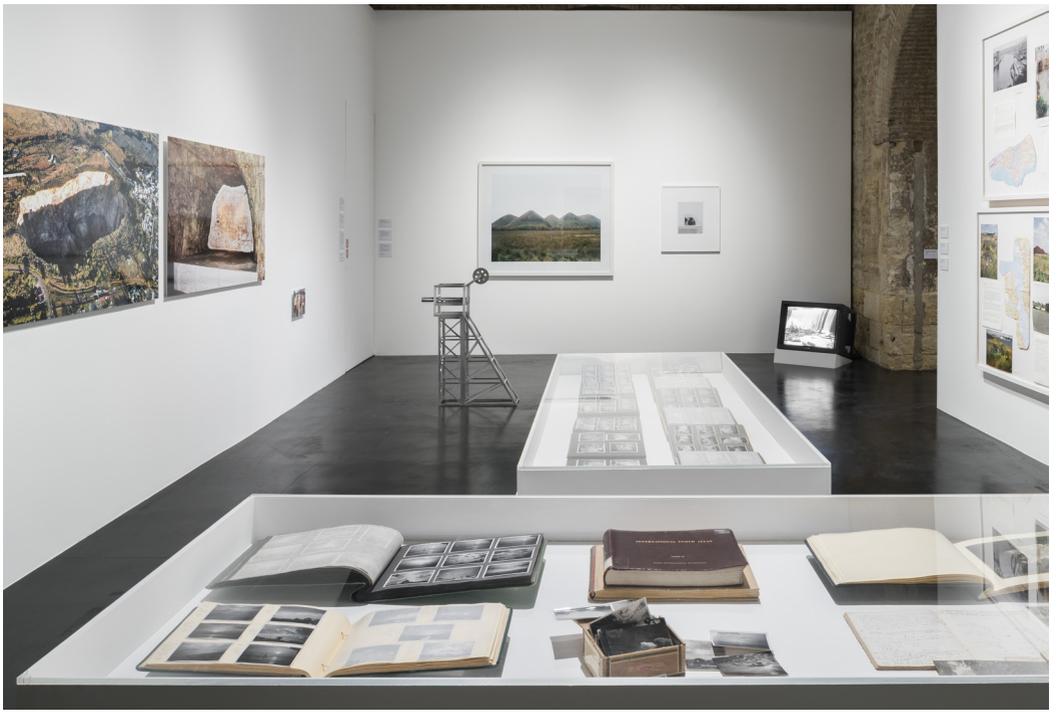
Marianne Heier

Oslo, 1969. Lives there.

The video *Saga Night* (2008) documents the making of a sculpture that now forms part of the collection of Maihaugen, an open-air museum of cultural heritage in Lillehammer, Norway. Maihaugen features a collection of historical buildings—including churches, farmsteads and shops—laid out in a more-or-less chronological manner. The residential area of the museum includes houses representative of the decades of the 1900s to the House of the Future from 2001, showing the development of the Norwegian home and different architectural styles. Marianna Heier installed a section of new asphalt on this street from a point that corresponds to 1968—the year of the first petroleum and natural gas discoveries on Norwegian territory in the North Sea. The asphalt runs through







the sections corresponding to the 1970s, 1980s, and 1990s, and finishes where the street ends at the edge of a forest.

Saga Night calls attention to the radical changes that oil brought to modern Norway, a narrative that is conspicuously absent in the typical history of the nation. It points to an economy and culture built not through generations of human toil or thriftiness but through a sudden and decisive appropriation of vast natural wealth. From a petrol-capital perspective, Norway's neighbours would not be Sweden and Denmark, but Qatar, Iran, or the United Arab Emirates—states that have similarly invested substantial oil money in cultural projects and contemporary art.

For the period of 2005–2006, Heier was awarded a Norwegian-government artist's grant—money that originates from North Sea petroleum revenue—yet she chose to continue working jobs in publicly-funded Norwegian art institutions. She placed her income in shares in the Norwegian oil and offshore industry, thus reinvesting the grant money back into its original source. *Investment* (2007) comprises the artist's tax declaration for this period. The later sale of the shares financed the production of *Saga Night*.

Pierre Théron

Nérac, Lot-et-Garonne, 1918–Bordeaux, 2001.

Pierre Théron is perhaps best known for a number of large-scale public and corporate commissions which include tapestries and a façade made in 1969–70 for the Maison du Paysan, Mutualité Sociale Agricole, at 13 Rue Ferrère, Bordeaux (next door to the CAPC) and a monumental mosaic for the lycée in Marmande, Lot-et-Garonne (1974).

In 1956–7, Théron was invited to work at the Shell-Berre oil refinery in Pauillac, on the banks of the Gironde 50 km north of Bordeaux. He made a number of bold crayon drawings of the industrial structures in preparation for a relief sculpture as well as studies for a series of health-and-safety posters alerting employees to on-site hazards—a community of fifty houses for workers and their families had been built on the site. During this period the refinery was increasingly specialized in processing crude oil from Venezuela, a source that had gained critical importance as Middle Eastern oil imports had ceased due to the Suez crisis in late 1956. Shell stopped all refinery activity at Pauillac in 1986 and the site was transformed into a petroleum depot, now operated by the CIM-CCMP group.

Bernd Becher and Hilla Becher

Siegen, North Rhine-Westphalia, 1931–Rostock, 2007; Potsdam, 1934–Düsseldorf, 2015.

For five decades, Bernd and Hilla Becher documented what they called ‘anonymous sculptures’—obsolescent engineering structures and buildings, particularly those associated with the extractive industries in Europe and the US. The couple began their collaboration in 1959 and first turned their attention to the German Ruhr region that includes the cities of Dortmund and Essen. This area was by then already in decline as the coal-and-steel heartland of Europe, not simply due to the depletion of raw materials, but also because of increasing debt, as well as the availability elsewhere of cheaper labour and more up-to-date technology.

The artists’ characteristic ‘typologies’ are grids of precisely composed black-and-white photographs, exactly arranged individual variants of a single subject: blast furnaces, cooling towers, gas tanks, mine heads, kilns, oil refineries, and so forth. The prevailing reading of this body of work is that it is detached and lacking emotion. Yet the Bechers’ enthralled attention to collecting and ordering images of a disappearing world was motivated by devotion and adoration. Bernd Becher characterized his experience of the demolition of an iron-ore mine near his childhood home in 1957 as being the “trigger for everything”. “I was overcome with horror when I noticed that the world in which I was besotted was disappearing”, he stated.

Since the 1990s, the Ruhr region has transformed itself into a culture and heritage destination. The former Zollverein Coal Mine Industrial Complex, for example (once the largest facility of its type in Europe, in operation from 1851 until 1986) is now a regional museum and UNESCO World Heritage Site.

Gallery 7

Christina Hemauer and Roman Keller

Zürich, 1973; Liestal, Basel-Landschaft, 1969. Live in Zürich.

Indigo is an exemplary substance in world ecology and the making of the modern commodity market. The biography of the plants from which the eponymous vivid blue textile dye can be produced is intimately intertwined with a long and global history of cultivation and agrarian reforms, logistics and trade, political economy, climate and colonization. A recent chapter of this history would incorporate

the 'loss' of the British indigo-producing colony of South Carolina in the 1770s during the American Revolution. With a ceaseless demand for textile dye in Europe, it was another British-controlled colony, Bengal, that would then grow to become the pre-eminent indigo producing area from the 1790s.

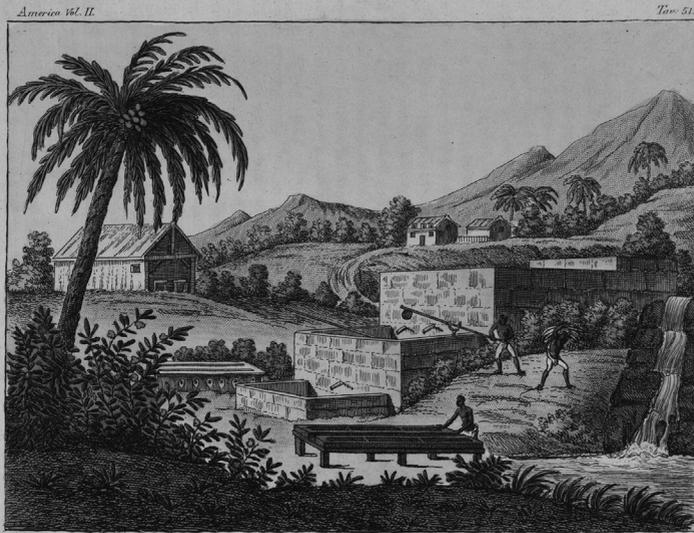
Yet the invention and commercialization of artificial dyes (synthesized from coal tar) at the end of the 1800s led to a drastic fall in demand for natural plant dyes, and by 1914 indigo production in India had almost stopped. Chemists had discovered a more colourful, and more reliable, version of nature. The German and Swiss family firms that transformed into global companies thanks to synthetic dyes—including Geigy, Bayer, Hoechst, and the biggest of all, BASF—would come to dominate the chemical industry for the next century and a half.

Christina Hemauer and Roman Keller delve into this coproduction of botany, capital, coal, and colour in *Untitled (Blue)* (2017), their new project for *4.543 billion*. It takes place through the form of an emblematic invention of modern art—the large-scale abstract painting—and an iconic cloth of American frontier mythology: blue denim. The artists' 'painting' is comprised of two elements of stretched textile with an audio narration. One part is cotton that has been incrementally hand-dyed using natural indigo to produce a gradient effect, while the other part is denim that has been progressively bleached.

Giulio Ferrario
Milan, 1767–1847

Il costume antico e moderno [Ancient and modern costume] is a richly-illustrated encyclopedia of world culture focussing on "the history of government, the military, religion, arts, sciences and traditions of all ancient and modern peoples". Designed to be both educative and entertaining, it was originally published incrementally between 1817–1834 from Milan as a subscription series of 143 fascicules that comprised 21 volumes. This plate shows the production of indigo, the deep blue textile dye made from *Indigofera tinctoria* and related plants. Indigo would have been one of the many commodities that came through what is now the CAPC building.

During the late sixteenth and early seventeenth centuries, several European countries—including France, Germany and Britain—prohibited indigo in order to protect local blue-dye industries based around the native plant woad (*Pastel des teinturiers*). Indigo's



Fabbricazione d'Indaco Borinardoni inv.

10



Giulio Ferrario, *Fabbricazioni d'Indaco* [Manufacturing of Indigo], Plate from *Il costume antico e moderno, America*, Vol. 2, 1817–1834
Collection Chatillon, Musée d'Aquitaine, Bordeaux.

Pep Vidal, *19 metre tree cut in 7 equal volumes*, 2015
Courtesy of the artist and adn galeria. Photo: Roberto Ruiz.

eventual dominance as a transatlantic cash crop in the seventeenth century came as the prospects for Indian indigo declined and the French in Saint-Domingue, the British in Jamaica, and the Dutch in Java, cheapened what was a highly labour-intensive process through the use of slaves. Ferrario's illustration appears as part of a discussion about agriculture in South Carolina, the colony that dominated the indigo trade from the 1740s to the 1850s and had a dramatic effect on the importation of slaves from Africa.

Between Gallery 7 & 8

Rodney Graham

Abbotsford, British Columbia, 1949. Lives in Vancouver.

Two Generators (1984) is a four-minute 35mm film described as a "river illuminated by means of 2 self-sufficient commercial lighting systems for the duration fixed by the length of 1 roll of motion picture film". It was originally designed to be screened repeatedly in a commercial cinema. The footage was shot at night by a forested ravine near Vancouver, British Columbia. Graham towed a pair of diesel generators to the site to power floodlights that enabled a camera crew to shoot a river in the darkness. The film documents the turning on of the noisy generators followed by the illumination of the floodlights one after the other, and the shutting off of the same to reveal the sound of the rushing river before the film runs out. When Graham was four years old his family lived in a logging camp and the artist's father, the camp manager, played the role of projectionist by showing films for his son and the workers deep in the forest.

Gallery 8

Amy Balkin

Baltimore, Maryland, 1967. Lives in San Francisco.

During the course of the exhibition, *Today's CO2 Spot Price* (2009) charts the daily price of carbon dioxide emissions allowances in the world's largest carbon market, the EU Emissions Trading Scheme. A numbering system is manually updated every morning to show the price in Euros of an entitlement to legally emit one metric tonne of CO2. Polluters—power plants or factories—receive or buy emissions allowances at auctions and trade them as needed to minimize costs. A product of the increasing dominance of the finance sector and the expansion of financial derivatives that emerged in the 1970s, the carbon market 'fix' has abstracted the qualitative problem of

climate change mitigation into a commodity market based on a molecule treated as the singular cause. There is a trend towards emissions that can be lucratively 'avoided', while there has been little effect on structural fossil fuel dependence. In this perspective, global warming is a market failure that can be corrected by governing the atmosphere via an economic instrument with no real material or historical reference.

Pep Vidal

Barcelona, 1980. Lives there.

Pep Vidal is an artist and a mathematician with a special interest in infinitesimals (things that are so small that it is not possible for humans to measure them) and false randomness (things that only seem variable and unpredictable, yet can be explained by very complex or as yet unknown laws). A poplar tree had been cut down on the property of a friend of the artist near Lleida, Catalunya, as it was at risk of falling onto the house. Surprised by the sheer mass and intricacy of the tree's forms, Vidal decided to develop a more reasoned way to perceive it—by 'knowing' it as rigorously as possible from a do-it-yourself empirical perspective. During six days, Vidal and a colleague calculated the volume of every branch of the tree using measuring tapes and callipers, accepting an allowable 3% error. This information was fed into software to create a 3D model of the tree that was used to determine the position of six cuts that divided its bulk into precisely equal volumes.

This somewhat absurd exercise addresses the paradox that the practices of standardization, quantification and mathematization that have given rise to extraordinary value and knowledge over the last centuries, also represent the advance of a perspective that has allowed the commodification and management of nature. Vidal's wooden sculpture exhibits the results of applying classical geometry to nevertheless try to compute something largely immeasurable and unexplainable. His analysis of an otherwise unremarkable tree ends up confronting the plant's utter uniqueness. Entitled *Árbol de 19 metros cortado en 7 volúmenes iguales* [19 metre tree cut in 7 equal volumes], the cleft poplar was first exhibited in a gallery in Barcelona in 2015, and has since been lying in the open air in a woodland near Girona, Catalunya, before being transported to Bordeaux for this exhibition.

Lucas Ihlein and Louise Kate Anderson
Sydney, 1975. Lives in Wollongong, New South Wales; Sydney,
1987. Lives there.

As his contribution to the 2010 exhibition *In the Balance: Art for a Changing World* at the Museum of Contemporary Art Australia in Sydney, Lucas Ihlein set out to conduct an informal environmental audit of the same exhibition, described as a survey of artists “engaged with pressing environmental issues and debates”. Ihlein was curious about the ecological footprint of the exhibition itself—the energy and resources required to stage and sustain it—and more elusively, whether its benefits outweighed its costs. Working from a black-board lined ‘audit room’ in the galleries, and roaming the museum to converse with staff and visitors over a period of four months, Ihlein approached the process, not as a professional consultant, but as an artist-layman who was learning as well as doubting in public.

The process of *Environmental Audit* was documented via a succession of blog posts by the artist (at www.environmental-audit.net), and ten diagrammatic posters, made in collaboration with Louise Kate Anderson, that attempted to visually synthesize the complexities of the exhibition as a series of material and immaterial flows. Extending beyond energy calculations and efforts to optimize the institution’s recycling practices, the project also came up against some of the ambiguities of green economics. How can knowledge be valued or the ‘services’ rendered by natural systems be accounted for? Moreover, do audits that assess carbon emissions and put a price on them carelessly repackage the biosphere as a financial market?

UNDER GROUND was drawn for the cover of the June 2010 edition of the Australian art magazine *Artlink* that was guest-edited by Ihlein. It maps the historical and symbolic crossovers of ‘the underground’ as a term describing both unofficial, illicit, anti-establishment culture, as well as a literal subterranean space or network.

Lara Almarcegui
Zaragoza, 1972. Lives in Rotterdam.

Lara Almarcegui has made a series of inventories that involve studying and calculating the weights of the principal construction materials that comprise whole museum and art-fair buildings, as well as entire cities. Calculations are made by compiling known measurements from district plans and architectural drawings; when this information has not been readily available, structures

have been surveyed directly and inventoried systematically. The resultant material enumerations, five of which from 2005–8 are presented here, are ordered by descending total weight, as if the raw ingredients of the particular building before it was built, or an indication of its return to primary components on its destruction.

Between Gallery 8 & 9

Documentation of *Steam* (1967/1995) by Robert Morris.

From March to June 1995, the CAPC nave hosted *Steam* by the American artist Robert Morris, a sculptural installation originally conceived in 1967. In the work, clouds of water vapour continuously rise from a field of fluvial stones, which had been sourced from the Gave de Pau river in south-eastern France. The planned duration of the exhibition had to be cut short as the high humidity in the nave began to cause mould on the walls.

“Dig deep enough beneath the very spot of which *Steam* is installed and what would be found?”, the artist has written. “Old pottery, broken, once polished stones from forgotten settlements... But dig deeper still and see a broken oil lamp, a Roman bronze strigil. Go deeper, beyond every human artefact and into the Earth’s crust and heat rises. Smoke and the churning innards of the grumbling gut of the Earth itself belches up its indigestions in sulphurous clouds”.

Gallery 9

Maria Thereza Alves
São Paulo, 1961. Lives in Berlin.

Ongoing since 1999, Maria Thereza Alves’s *Seeds of Change* project focuses on the phenomenon of ‘ballast flora’, an overlooked area of botanical study enmeshed with the early history of global capitalism and the slave trade. Since around 1920, modern cargo ships have taken on water as ballast to stabilize an unloaded vessel, yet in the past sailing ships would have used soil as ballast if their load of colonial goods was too light. This was bulk that could easily be discarded to free up the ship. From c.1500–1815, countless tonnes of this filler material and its attendant seeds were displaced through the network of global maritime commodity and slave trading, to be dumped on riverbanks and shores around the port cities of Europe. Still today many ‘alien’ plants—inadvertent colonists, including those originating in Africa and the Americas—can thus be found rooted

in these sites. They often spring up when ground is disturbed for new construction.

Although the slave trade was made illegal in France in 1815, no effective enforcement on ship owners was set up until 1831. Clandestine expeditions persisted in Bordeaux until at least 1837—at least 42 slaving voyages are known to have left the port after 1815.

Alves has undertaken research and fieldwork in several locations, including Marseille and Dunkirk, as well as in the British port that leaves all other cities far behind in terms of the sheer number of slaving expeditions that left its docks: Liverpool. The artist traced the whereabouts of ballast spoil sites through maps and port records, gathering textual and photographic evidence, often with the collaboration of local residents. Alves has also taken soil samples and endeavoured to germinate the archaic seeds to create a flourishing of the ostensibly historical archives that have lain dormant for sometimes hundreds of years. Recently this has led to the creation of a ballast flora garden on a floating barge in the city of Bristol.

Alfred Roll
Paris, 1846–1919.

From 29 June until 5 November 2017

Between 1878 and 1894, Alfred Roll painted a series of Realist works depicting the world of industry, and more pointedly, comprising statements of solidarity with the harsh circumstances of the worker at a time of great social unrest. Representing an elderly quarryman in his smock, *Le Vieux Carrier* [The Old Quarryman] (1878) began this sequence when it was first exhibited at the Paris Salon in 1879. It is one of the few Roll portraits whose subject remains anonymous, yet the man depicted was undoubtedly a genuine labourer rather than a model—the artist was later known to welcome miners and their families to sit for portraits in his studio. Is it not known where the man would have been working. Yet given Roll's later depiction of stonemasons on a quayside in Suresnes, near Paris, (*Le Travail, chantier de Suresnes (Seine)*, 1885), one might speculate that *Le Vieux Carrier* represents both the large-scale infrastructural projects taking place around the capital at the time, as well as the increasing reorganization of the French workforce in the extractive industries through retiring older workers and cutting wages. Roll would go on to spend several months living and working around the coal mines of Charleroi, Belgium, and Anzin, in the Nord-Pas-de-Calais region of

northern France, and he presented the celebrated painting *Grève des mineurs* [Miners' strike] at the 1880 Salon. Roll seems to have painted from the perspective that exhaustion unfolds through human labour systems as much as through the depletion of raw materials.

Alfred Smith
Bordeaux, 1854–Paris, 1936.

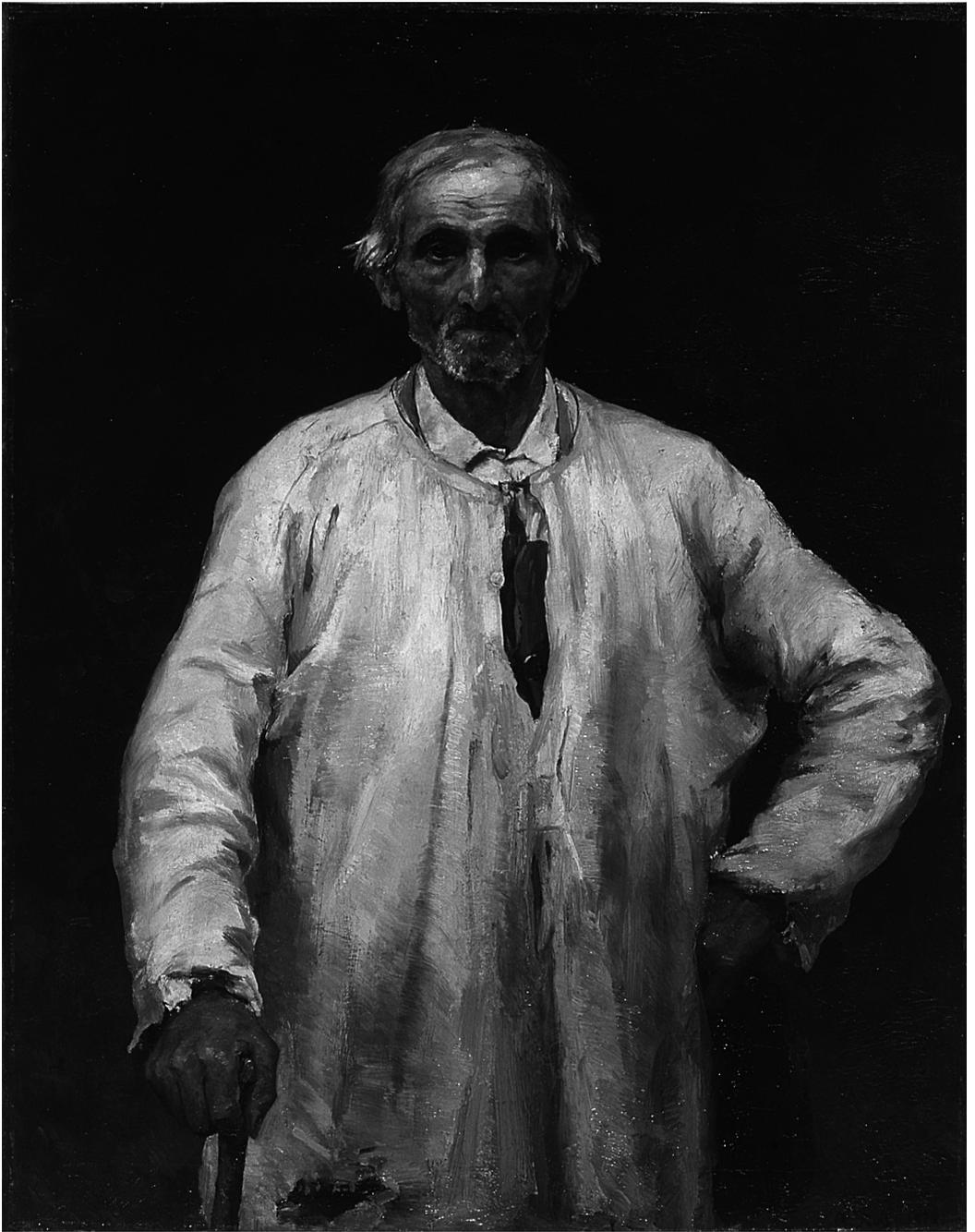
From 6 November 2017 until 7 January 2018

Le Quai de la Grave [The Grave Docks] (1884) is one of a number of Bordeaux cityscapes by the painter Alfred Smith in which the effects of the weather and the time of the day are treated with great fidelity. A mason appears to be sizing-up a large limestone block that has been brought downriver by boat. Other workers take a rest in the shade of the water tank and the sentry box during what appears to be a scorching hot summer afternoon in Bordeaux.

The seasonal movement of migrant stonemasons from central France, especially the Creuse *département*, was an established and widespread feature of the construction industry by the late-eighteenth century. Migrants had travelled by foot for centuries, but with the introduction of railways to central France in the 1850s this began to change. Paris was the main magnet, but many young men also departed every March to look for work in Lyon, Bordeaux, and other cities. Until at least the beginning of the twentieth century, construction in France was defined by the cutting, dressing, and placing of stone, and the industry would have encompassed a wide range of specialist and physically demanding jobs—from quarrymen to masons, roofers, and pavers. By the time of Smith's depiction, much of the precision of stone cutting would have been done at the quarry site itself. Finishing, polishing and decoration would have been carried out on site. Building work had started to organize trade unions in the early 1880s and a national building trades' federation was founded in Bordeaux in 1892.

Ângela Ferreira
Maputo, 1958. Lives in Lisbon.

Ângela Ferreira's works in the exhibition form part of a series titled "Stone Free" (2012) in reference to the 1966 hit song performed by Jimi Hendrix (1942–70). "Stone Free" creates correspondences between two voids below the ground, two 'negative monuments' as the artist has termed them: Chislehurst Caves, in southeast London, and Cullinan Diamond Mine in Gauteng Province, South



Alfred Roll, *The Old Quarryman*, 1878
Collection Musée des Beaux-Arts de Bordeaux.

Africa. Chislehurst Caves is a man-made network of underground tunnels mainly worked in the late 1700s yet dating back to as early as 1250. The tunnels were excavated in order to mine chalk and flint. Following their use as an air-raid shelter during the second world war, the tunnels were transformed into a venue for rock concerts in the 1960s and 1970s. The Jimi Hendrix Experience played there in 1966 and again the following year, bringing Hendrix's unique countercultural synthesis of social realism and psychedelic spiritualism based on African and indigenous-American imagery into the literal underground.

Cullinan Diamond Mine (known as Premier Mine from its establishment in 1902 until 2003) is famed for being the source of the largest gem-quality rough diamond ever discovered, in 1905. Most of the gems cut-and-polished from this stone were used to adorn the Crown Jewels of the United Kingdom. The recent history of the diamond industry is inextricable from that of settler colonialism in southern Africa and a commodity cartel established by the De Beers corporation founded in 1888 by British imperialist Cecil Rhodes (1853–1902), two years before he became Prime Minister of the Cape Colony. De Beers owned all of the major mines in South Africa, as well as controlling global distribution, until it began a recent sell-off of its less productive mines to the Petra Diamonds group, including divesting itself of Cullinan in 2008.

Stuart Whipps

Birmingham, United Kingdom, 1979. Lives there.

As surprising as it may now seem, in the later part of the 1800s Scotland was at the centre of the global oil industry. Oil shale could be found in abundance in a band from the Firth of Forth in the north to Addiewell in the south. Vast amounts of waste were produced in retorting this rock: heating it to distil liquid oil for lighting and lubrication. The spoil was piled into huge heaps, known colloquially in Scotland as 'bings', that still loom up to 90m high over the low-lying landscape between Glasgow and Edinburgh.

The unique peaked summit known as Five Sisters was listed as a historic monument following the intervention of artist John Latham (1921–2006)—a pioneer of Conceptual art in Britain. During 2013, Stuart Whipps was led to visit this and other West Lothian shale bings through his own research into the work of Latham. Other historical protagonists soon came into play, not least James 'Paraffin' Young (1811–1883), who set up Addiewell Oil Works in 1866, the world's largest facility of its kind at the time. Young

financed several expeditions by his friend, the missionary and explorer David Livingstone (1813–1873) who was the first European to see the waterfall known as Mosi-oa-Tunya, which he renamed Victoria Falls in honour of the British monarch. On Livingstone's death in 1873, Young built a miniature replica of Victoria Falls in the grounds of his Scottish mansion. The capital of the British colony known as North-Western Rhodesia was subsequently named in honour of Livingstone (now Maramba, Zambia). John Latham was born there in 1921.

In companion to the three artworks from 2012–3 exhibited at the CAPC, Whipps is presenting a new off-site work entitled *Thin Section: Scottish Shale* (2017) in the galleries of the Musée des Beaux-Arts, Bordeaux. Two nineteenth-century paintings by Alfred Roll and Alfred Smith in turn join this exhibition at the CAPC.

Antoine J Aalders
Amsterdam, 1890–1955.

Antoine J Aalders's fascination with the weather led him to document the skies—over his house in the Netherlands, from a specially-built observatory, during airplane flights, as well as at sea. From the 1920s to the 1950s he assembled dozens of meticulous notebooks and took more than ten thousand photographs, a selection of which are presented here.

Attempts to use photography to create an international classification of clouds date back to at least the 1870s. The collective work of enthusiasts in photographing clouds has provided invaluable information for climate scientists and those working in the military or agriculture. Cloud identification follows the binomial latinized genus-species naming system for living organisms formalised by Carl Linnaeus (1707–78). One might speak about *Cumulus humilis* with haze, extensive *Stratus nebulosus*, or clouds produced by waterfalls, volcanic eruptions, or jet engines. Since the early 1980s, as predicted by a warming climate, clouds have been shifting towards Earth's poles and extending higher into the atmosphere.



Stuart Whipps, *A postcard of Victoria Falls leaning against a geological sample from John Latham's mantlepiece*, 2012
Courtesy of Paul Mckeown.

Nicholas Mangan, *Ancient Lights*, 2015
Courtesy of the artist; Sutton Gallery, Melbourne; Hopkinson Mossman, Auckland; and LABOR, Mexico City.

Gallery 10 (and Roof Terrace)

Nicholas Mangan

Geelong, Victoria, 1979. Lives in Melbourne.

Ancient Lights (2015) is a two-screen looped audiovisual installation that is powered literally as well as metaphorically by the energy of the sun. A photovoltaic panel system has been installed on the roof terrace of the CAPC building. This charges the batteries located within the gallery that power the video projectors. The title of the work, *Ancient Lights*, derives from a legal notion of a 'right to light' and signs that can still be seen in London to mark windows that are protected from any future construction that might obstruct their access to sunlight.

On one screen we see a Mexican ten pesos coin in a never-ending slow-motion spin. The reverse of the coin depicts the Sun Stone, a carving that is key to our present understanding of Aztec cosmology and the belief that constant blood offerings were required to prevent the sun from disappearing. The companion film weaves together several formal and discursive threads—both human nature and natural history. We see solar-cycle charts that have their origins in the theories of Alexander Chizhevsky (1897–1964), the Russian scientist who proposed that the eleven-year cycle of the sun's magnetic turbulence could be linked to social unrest and revolutions. A rotating cross-section of a tree shows rings that hold information about the climate of the past, as if a wooden database. Ranks of mirrors focus sunlight onto a central tower-boiler at a solar power plant near Seville, Spain. Thanks to salt storage technology, this facility is the first solar power station capable of operating twenty-four hours a day. As well as addressing broader narratives about periodicity and transformation, with the off-grid powered *Ancient Lights* Mangan also hints at small-scale efforts to circumvent the political intransigence in his native Australia in relation to fossil fuels and climate change.

This gallery guide was devised for the exhibition

4.543 billion. The matter of matter 29.06.2017–07.01.2018

Curated by

Latitudes

As part of the cultural season *Paysages Bordeaux 2017*

With

A.J. Aalders, Lara Almarcegui, Maria Thereza Alves, Félix Arnaudin, Amy Balkin, Alessandro Balteo-Yazbeck in collaboration with Media Farzin, Bernd and Hilla Becher, Étienne Denisse, Hubert Duprat, Giulio Ferrario, Ângela Ferreira, Anne Garde, Ambroise-Louis Garneray, Terence Gower, Rodney Graham, Ilana Halperin (also at the Université de Bordeaux's zoology department), Marianne Heier, Christina Hemauer and Roman Keller, Lucas Ihlein and Louise Kate Anderson, Jannis Kounellis, Martín Llavaneras, Erlea Maneros Zabala, Nicholas Mangan, Fiona Marron, Alexandra Navratil, Xavier Ribas, Alfred Roll, Amie Siegel, Lucy Skaer, Alfred Smith, Rayyane Tabet, Pierre Théron, Pep Vidal, Alexander Whalley Light, Stuart Whipps (also at the Musée des Beaux-Arts) as well as documents and objects lent by the archives of the CAPC, the Archives Bordeaux Métropole, the Archives départementales de la Gironde, and the geology collection of the UFR Sciences de la Terre et de la Mer, Université de Bordeaux.

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Within the exhibition framework, Latitudes will lead the residency programme *Geologic Time* at Banff Centre for Arts and Creativity, Alberta, Canada, in September–October 2017.

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Courtesy of the artist.

Back cover: Xavier Ribas, from *A History of Detonations*, 2014

Courtesy of the artist and ProjecteSD, Barcelona.

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