One of the Worlds
Sensitive Stones and Unexpected Homologies

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Curated by **Eleonora Savorelli**

Works created during an artist residency at the Muséum national d'Histoire naturelle, produced by MuPa with scientific support from Pierre Sans-Joffre and Sylvain Bernard.

Two concluding exhibitions produced by MuPa, in collaboration with the Museo d'Arte della città di Ravenna and the Institut Bibliothèque Polonaise de Paris.

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Foreword

by Mupa

"One of the Worlds. Sensitive Stones and Unexpected Homologies" is the title of the exhibition presenting the outcomes of the residency organized by MuPa, featuring the Polish artist Matylda Tracewska. Developed in collaboration with the French National Museum of Natural History in Paris, the residency was accompanied by the Italian curator Eleonora Savorelli, who worked with the artist throughout the entire creative process and serves as curator of both outcome exhibitions.

MuPa, whose aim is to introduce a broad public to the work of contemporary artists experimenting with the medium of mosaic, is also committed to supporting artists throughout their research and production processes. The results of this first residency confirmed the relevance of our approach, initiated in spring 2023 with the exhibition "Representations" by the artist Clément Mitéran.

In light of the evolution of her work, increasingly focused on interactions with mineral matter, the choice of the artist Matylda Tracewska appeared an obvious one for a Museum residency. Following an initial exploratory week in spring 2025, Matylda Tracewska undertook a one-month residency in September 2025 within the facilities of the Institute of Mineralogy, Materials Physics and Cosmochimistry (IMPMC) and the Museum.
Tracewska and Savorelli benefited from fruitful exchanges with the laboratory's scientists, in particular Pierre Sans-Jofre, Senior Lecturer and Head of the General Geology Collection at the Museum, and Sylvain Bernard, Researcher and Deputy Director of the IMPMC.

"One of the Worlds. Sensitive Stones and Unexpected Homologies" is a project situated at the intersection of natural sciences, ethnology, and philosophy. The starting point of this artistic research lies in the study of specific stones—symbolic witnesses to the emergence of life on Earth—serving as a link between inert matter and life: stromatolites.

Two mediation initiatives carried out in September 2025 at the Museum and the IMPMC, aimed at researchers, the general public, and art professionals, made it possible to assess the depth of the encounter established during this residency—particularly thanks to the great freedom granted to the artist and the strong involvement of Pierre Sans-Jofre and Sylvain Bernard. The residency enriched Matylda Tracewska's

work through multiple exchanges with scientists, while the scientists' own perspectives on their objects of study were transformed and deepened by the artist's sensitive approach.

Particularly interested in hybrid forms, MuPa is delighted with this first art-and-science experiment, as well as with the collaborations carried out with the Museo d'Arte della Città di Ravenna (Ravenna, Italy) for a first exhibition presenting the outcomes of this work, held during the 9th Biennale di Mosaico Contemporaneo, and for a second one with the Polish Library Institute in Paris.

The Splendid Structure of the World

by Eleonora Savorelli

A door opens, a door shuts. In between you have a glimpse: a garden, a person, a rainstorm, a dragonfly, a heart, a city. [...]I Everything is changed in a minute. [...] So a poem takes place[1].
They [the stones] resemble a mountain, an abyss, a cavern. They condense extension, they epitomize duration. They are the object of long daydreams, meditations, hypnosis. They are support for ecstasy, means of communication with the True World[2].

Matylda Tracewska introduces me to the origins of her imagery, moving through a delicate yet resonant silence. The language the stones speak to her is foreign to me, born billions of years ago. Perhaps the secret to understanding it is to realise it beats to the same rhythm as our own hearts.

On a page of my notes dating back to my residency at the *Muséum national d'Histoire naturelle*, I read: "I inhabit the gap between the studio and reality". I am familiar with Tracewska's work through the bond she shares with Ravenna, the city where she studied mosaics and lived for several years. In her practice, mosaic and painting combine with stone, giving life to a dense synergy between artistic research and natural geometries. In *L'écriture des pierres*, Roger Caillois defines this as cooperation: "he who paints thus cooperates with nature. [...] he implicitly admits that nature, with or without the collaboration with an artist, can produce compositions of shapes and colors acceptable as works of art"[3]. Pliny the Elder also repeatedly defines nature as an artist—"Natura Pictrix"—insofar as it is capable of creating flowers and plants, trees and animals[4].

Tracewska gives priority to the stone's voice, no longer treating it as background or support, but elevating it to an integral and fundamental part of the work. The stone conveys the message. Upon seeing them, untouched, stones may intimidate a fleeting eye due to their mysterious and poetic charge. However, once the value they have held over the centuries—and consequently the importance they hold in the world today— is acknowledged, one can begin to discern the first figures that, like flowers, from the Earth, sprout from Tracewska's hand. The artist and the stone unite to make one of the possible worlds appear. The observation of stones in Tracewska's work implies a physical and hermeneutic relationship[5] with the very stones assuming the function of a blank paper sheet, an untreated canvas, a block of marble to be carved.

That "gap between the studio and reality" arises because the artist's time does not exactly overlap with the time flowing outside the studio. Tracewska's artistic power lies in her ability to reset it, to rewind it to the era before human beings appeared, in order to propose a new and surprising vision. This is what happened during the research at the Department of Geology of the *Muséum national d'Histoire naturelle* in Paris (fig. 1).



figure 1

The artistic project was being developed over several months during which, working closely with Tracewska, I was able to immerse myself in her world and in that of the stones in the collection. Sharing such an experience with the artist is unusual for those in curatorship, a role that usually sets in motion once the artistic process is complete. From the selection of the stones to the study of literature, from the development of visual research to the creation of the pieces, the analysis of Tracewska's artistic-scientific approach encompasses every stage of creation. The research took shape over time, modeled through the ear of the artist who, with patience and wisdom, listened to the steps of the world. Cradled in this dimension, the *Jardin des Plantes* became our flowered island, a colored cartography that would transform before our eyes every day. To read nature is to grasp its poetry.

The *sous-marins* of the Geology Gallery—which recall the wooden interiors of sailing ships, but also the subterranean depths of the Earth—became the submarines of our minds: we searched, excavated, opened drawers, checked what was inside, looked more closely. We learned the history of a fascinating place and its collection: more than 800,000 stones, the result of worldwide expeditions over the last two centuries, cataloged by origin and type. Among the astonishing donations preserved at the Muséum, we could admire a part of Caillois's collection (fig. 2 and 3). Tracewska was able to visit magical universes and identify the direction of her research with greater concreteness. Accompanied by Pierre Sans-Jofre, scientific head of the department, and Sylvain Bernard, researcher at the IMPMC, the selection of the stones began.

"I speak of stones that have always slept in the open air or that rest in their lair [...] Architecture, sculpture, glyptics, mosaic, jewelry have done nothing with them. They date back to the dawn of the planet, sometimes coming from another star"[6].



figure 2



figure 3

Holding a stone in our hands, infinite possibilities emerged in front of us: mountains, lakes, forests could host our thoughts and give them space in which to materialize. Vittorio Lingiardi speaks of *mindscapes* as "visual perceptions that become mental visions"[7]. These are places that reflect and embody emotional states already present within us: "we can look at a landscape as a part of the real world, a place of identity and personal and collective memory, a mirror of our emotions, a space of sensory immersion"[8].

Contemplating the landscapes suggested by the stones selected by Tracewska, one moves from the great terrestrial dimensions to the small dimensions of bacteria that settle on the stones and fossilize there; from the dimensions adequate to the human being to the collective ones of the vegetal, animal, and mineral worlds. Tracewska's language reaches corners of the psyche that trigger primal echoes, like when the gaze fixes on the hypnotic movement of fire. These are stones that speak of beginnings, and all beginnings carry promises.

Among the rock formations that are currently the subject of study for the geologists of the MnHn are stromatolites, witnesses to the presence of the first forms of life on Earth up to 3.5 billion years ago. As illustrated by Sans-Jofre in his text, these are stones that thrive in hybrid environments, where water meets land. Fascinating stones that hide exceptionally interesting and poetic patterns under a protective shell resembling the shape of a cloud—in ancient China, stones were called "cloud roots"[9]. The term "stromatolite" derives from the Greek *stroma*, meaning bed or layer, and *lithos*, rock. Tracewska chooses stromatolites as the core of her research, accompanied by *banded iron formations* (BIF), equally ancient and consisting of layers of iron and other minerals such as magnetite. The selected rocks, protagonists of the Earth's evolution, become the area of scientific and artistic investigation, stimulating reflections linked to the myths of the creation of the world and humankind.

Based on the geographical areas where the stones were collected, Tracewska investigates the myths and stories of the people who have inhabited them, finding in them space for human presence. An unexpected encounter is thus produced: through careful and microscopic analysis, inert matter becomes active, suggesting ideas to the artist, who interprets them through the mechanism of pareidolia—the tendency to seek familiar visual patterns in disordered images. With the help of the aesthetic characteristics of the stones, flowered meadows, desert landscapes, and vast expanses of water are projected, becoming dreamlike mindscapes, various dimensions of the soul. The stones become the starting point for an artistic practice that aims to make them "visually sensitive", capable of telling a story—that of the planet Earth—which they helped to create. In *Langues des pierres*, André Breton writes of *gamahés*, "figurative" stones in which it is possible to see faces and landscapes that are nothing more than "imprints of the elementary forces"[10] of Nature. Both inside and out, these stones hide "mysterious paintings" that belong to a "minéralogie visionnaire"[11] revealing a unique and individual truth that reflects that of the person observing them: "two beings [...] could not pick up the same stones, for it is true that one only finds what one deeply needs"[12]. Tracewska's *gamahés* carries the traveler towards an understanding of the world that intertwines science and poetry.

A pure spirit grows beneath the crust of the stones![13]

Some of the stones selected by Tracewska are remote formations, such as the stromatolite from Woman Lake, Canada (2.8 billion years old), and the BIF from Africa, part of the *Moodies Group* (3.2 billion years old). However, living stromatolites still exist in certain parts of the world. On my recent trip to Australia, I ventured on a short field expedition. From the center of Perth, it took me about two hours to reach Lake Clifton, inside Yalgorup National Park, passing through Mandurah. The lake appears as a tongue of water extending for about 20 km, and along its entire shore, it has hosted a colony of thrombolites for about 2,000 years. The experience was shared with Tracewska in real-time and sparked a great joy of witnessing the existence of these fascinating formations (fig. 4). The Australian continent is a land where I felt a strong energetic attachment. The *First People* possess a vast oral tradition regarding origins, and the land, while still bearing the wounds of an extremely controversial colonial past, transmits the purity of these messages to an ear that wishes to listen.



figure 4

The idea of investigating origin myths emerged in Tracewska's mind in no time, like the sparkle of a falling star or a meteorite. "Stones [...] continue to speak to those willing to listen to them. To every person they address a tailor-made language: by what the person knows, they teach what the person desires to know. Some seem to call to each other and, once brought together, it is possible to catch them talking to one another"[14].

The mythical aspect of Tracewska's research has two dimensions. The first is horizontal and concerns the tale, the story of the myth itself, thus the "known" of the narrative: a more or less universal weaving that unites perception and feeling. The vertical dimension is that of the "unknowable"[15]: the myth becomes a tool capable of questioning the aspects of the human being of which we are often not fully aware; accessing layers of the Self thought to be forever dormant.

Upon my return to Europe, the summer months preceding the residency in Paris were marked by several exchanges between Tracewska and I, while she had developed the visual research for the project and began to create her mosaics. The history of the world's civilizations is studded with mythical tales regarding the origin of the universe, the Earth, and humankind. Cosmogony and anthropogony are narratives that trace phenomena that science has often been able to prove and justify in more recent years. Over the centuries, civilizations, relying on their own beliefs and oral traditions, have found answers by observing the surrounding world and telling stories of universal and magnetic scope. The oral heritage of these populations has been collected by ethnology which, not without contradictions, would operate through transcriptions and recordings, but also reworkings and interpretations. The difficulty, or rather the impossibility, of reducing and homogenizing these myths—which change and evolve through oral transmission—is for Tracewska a potential through which, initially imagination, and then visual creation, can occur. Thus, science and ethnology can merge, meeting halfway between the measurable and the experienceable, between the rational and the sensual. As Tracewska points out to me, confirming the link of inexhaustible references between scientific and humanistic disciplines, Lévi-Strauss declares in a text: "I cannot conceive that a day will come when science will be complete and achieved . There will always be new problems, and exactly at the same pace as science is able to solve problems which were deemed philosophical a dozen years or a century ago, so there will appear new problems which had not hitherto been not perceived as such. There will always be a gap between the answer science is able to give us and the new question which this answer will raise"[16].

Thus, Tracewska's practice challenges time by bringing together stones that anticipated the arrival of humans by thousands upon thousands of years with myths that date back to a time relatively close to the present. Tracewska's works stimulate a chain reaction of questions which, once answers are found, are followed by others. They confront us with the vastness of the Earth and the universe, with the range of worlds that myths can conjure up before our eyes. A kaleidoscope of possibilities.

It is difficult to trace back to a time when painting and mosaic were not aligned with the stones, so mimetic and respectful is their coexistence: "hiding to reveal"[17]. These are the "unexpected homologies" born through sensitive stones—or rather through the human being who develops a greater sensitivity toward them. In biology, "homology" refers to the relationship between organs or morphological structures belonging to different taxonomic categories but having the same embryonic origin, such as between a primate's hand and a bird's wing. The homologies found in the stones concern the correspondence between what is scientific and what is mythical, between the matter describing the history of the Earth and that narrating its birth and upheavals—a whirlwind in which chaos and void are transformed into an ordered structure. To operate this coexistence between myth and art, between stone and science, Tracewska uses "reverse anthropomorphism", a concept and mechanism with which Marguerite Yourcenar defines Caillois's approach to stones. The human being realizes they are not at the center of the universe and that it is not the universe that resembles them, but rather the opposite: "[…] man, instead of attributing his own emotions, sometimes condescendingly, to all other living beings, shares humbly; yet perhaps also with pride, in everything contained or innate in all three realms, animal, vegetable, and mineral"[18]. Along with the humankind's rooting in the earth, I perceive in the artist's practice traces of what Novalis, quoted by Breton in Langues des pierres, calls "inverted astrology": "for them [the astrologers] the sky is the book of the future, while for you [the miners] the earth displays the monuments of the primitive world"[20].

Mosaic is configured as means to portray the stones, as in the case of *Ites and Tamettant*. The juxtaposition of tesserae amplifies the stone's existence in the present time, elevating it to an object of study and a work of art. The stone is carefully studied in its flow. Stone fragments, enamels, and mother-of-pearl mirror its visual rhythm and reproduce it through a skillful technique refined over years, as in *Untitled* and *Umvelinqangi / Unkulunkulu*. In this process, therefore, it is not the artist who bends the material to her will; she admires the "spontaneous beauty" that emerges through the contemplation of the stone. "They [the stones] seduce with a clean, infallible, immediate beauty that responds to no one. Necessarily perfect, it nevertheless excludes the idea of perfection, precisely because it admits no approximations, errors, or excesses. In this sense, this spontaneous beauty precedes and surpasses the very notion of beauty"[21].

The visual references that Tracewska reads on the stone confirm what the artist had already sensed in its form; in the poetry of her artistic gesture suggesting a new perspective on what surrounds us: "in extreme synthesis, one could say that poetry does not claim, in the end, to see *better*, but rather to see *other*"[22]. Painting is Tracewska's figurative medium: the hand traces, with pure and decisive gestures, figures whose presence the artist senses in the stone. Here is *The Emergence of Humanity* from the stromatolite from the Richat Structure in Mauritania. In the Cotham marble, *Yavanna and Nienna* camouflage themselves together with the *Cosmos* plants, with magenta-colored flowers, observed by the artist during her walks in the *Jardin des Plantes* (fig. 5). The white mare *Eiocha*, according to the reworking of a Druid myth, is born

from the foam formed by the encounter between land and sea, recalling that from which the universe was born, the quantum foam formed by tiny fluctuations of matter[23]. The marsh reeds of the Zulu myth hide the living beings who are then freed by *Unkulunkulu*. The muskrat dives into deep waters, here metaphorically between the two sections of North American stromatolites, to retrieve the grain of sand with which the magician *Nanabush* can recreate the Earth. Every myth, like every stone, holds the promise of a world within itself.



figure 5

All beginnings carry promises. The beginnings of life, the beginnings of the world, are born from stone: the Anima mundi. Looking at it, one glimpses the horizon and, perhaps, something even further away. Which beats to the rhythm of our hearts.

The splendid structure of the world sees it, alas!
Everyone, through the inverted telescope of their own passions,
so that everything, except themselves, shrinks and recedes,
so that one learns to enlarge only oneself[24].

1 S. Plath, *Un confronto*, in "Opere", Milano : Mondadori, 2024, p. 1265; "Una porta si apre, una porta si chiude. Nell'intervallo, avete intravisto qualcosa: un giardino, una persona, un temporale, una libellula, un cuore, una città. [...] In un attimo tutto è mutato. [...] É allo stesso modo che accade una poesia", translation E. Savorelli.
2 R. Caillois, *L'écriture des pierres*, Paris: Atelier EXB, 2015, p. 249; "Elles ressemblent à une montagne, à un abîme, à une caverne. Elles résument l'étendue, elles condensent la durée. Elles sont objets de longues rêveries, de méditations, d'hypnoses. Elles sont supports d'extase, moyen de communication avec le Vrai Monde", translation E. Savorelli.
3 Ibid., p. 263; "Le peintre coopère ainsi avec la nature. Qu'il découpe et encadre le marbre ou qu'il en exploite le dessin, il admet implicitement que la nature, avec ou sans la collaboration d'un artiste, peut produire des dispositions de formes et de couleurs recevables comme œuvres d'art", translation E. Savorelli.
4 Pliny the Elder, *Naturalis Historia*, 7.3, 9.52, 21.1; cit. in F. Barry, *"Painting in Stone": Early Modern Experiments in a Metamedium*, dans "The Art Bulletin", 99:3, 30-61, 2017, DOI 10.1080/00043079.2017.1292869.
5 É. Frémond, F. Farge, *La langue des pierres*, Muséum national d'Histoire naturelle, 26.04.21; https://www.youtube.com/watch?v=0yAe3fH8yuw (dernier accès 01.09.25).
6 R. Caillois, *Dédicace*, in "Pierres", Paris : Éditions Gallimard, 1966; "Je parle de pierres qui ont toujours couché dehors ou qui dorment dans leur gîte [...]. L'architecture, la sculpture, la glyptique, la mosaïque, la joaillerie n'en ont rien fait. Elles sont du début de la planète, parfois venues d'une autre étoile", translation E. Savorelli.
7 V. Lingiardi, *Mindscapes. Psiche nel paesaggio*, Milano: Raffaello Cortina Editore, 2017, p. 17; « percezioni visive che diventano visioni mentali », translation E. Savorelli.
8 Ibid., p. 8 ; « possiamo guardare un paesaggio come una parte del mondo reale, un luogo dell'identità e della memoria personale e collettiva, uno specchio delle nostre emozioni, uno spazio di immersione sensoriale », translation E. Savorelli.
9 M. Porro, *Altri pensieri delle pietre*, in "Doppiozero", 2023; "radici di nuvole", translation E. Savorelli; https://www.doppiozero.com/altri-pensieri-delle-pietre (last access 01.09.25).
10 A. Breton, *Langue des pierres*, in "Le Surréalisme, même", n° 3, 1957, pp. 62-69; "signatures des Forces élémentaires", translation E. Savorelli.
11 Ibid.
12 Ibid.; "deux êtres, à moins de se ressembler étrangement, ne sauraient ramasser les mêmes pierres, tant il est vrai qu'on ne trouve que ce

dont on éprouve en profondeur le besoin", translation E. Savorelli.
13 G. de Nerval, *Vers dorés*, in "Les Chimères", Paris : Michel Lévy Frères, 1856, p. 298; "Un pur esprit s'accroît sous l'écorce des pierres!", translation E. Savorelli.
14 A. Breton, *Langue des pierres*, in "Le Surréalisme, même", n° 3, 1957, pp. 62-69; "Les pierres [...] continuent à parler à ceux qui veulent bien les entendre. À chacun d'eux, elles tiennent un langage à sa mesure : à travers ce qu'il sait elles l'instruisent de ce qu'il aspire à savoir. Il en est aussi qui semble s'appeler l'une l'autre et qu'une fois rapprochées on peut surprendre se parlant entre elles", translation E. Savorelli.
15 A. Giannelli, *Soma e psiche: percezioni e pensieri in dialogo tra conosciuto e non conosciuto*, in Ciclo webinar Roma, Società Italiana di Psicoterapia Psicoanalitica, 06.05.22; "non-conoscibile", translation E. Savorelli.
16 C. Lévi-Strauss, *Myth and Meaning*, Toronto : University of Toronto Press, 1978, p. 14; « […] I cannot conceive that a day will come when science will be complete and achieved . There will always be new problems, and exactly at the same pace as science is able to solve problems which were deemed philosophical a dozen years or a century ago, so there will appear new problems which had not hitherto been not perceived as such. There will always be a gap between the answer science is able to give us and the new question which this answer will raise ».
17 O. Paz, *Préfaction*, in A. Breton, "Je vois, j'imagine", Paris : Éditions Gallimard, 1991, p. VI; "cacher pour révéler", translation E. Savorelli
18 M. Yourcenar, Introduction, in R. Caillois, "The Writing of Stones", Charlottesville : University Press of Virginia, 1985; p. XII; cit. in M. Gioni, *La lecture des pierres*, in R. Caillois, "L'écriture des pierres", Paris : Etelier EXB, 2015, pp. 21-27; « […] man, instead of attributing his own emotions, sometimes condescendingly, to all other living beings, shares humbly; yet perhaps also with pride, in everything contained or innate in all three realms, animal, vegetable, and mineral ».
19 H. von Ofterdingen, *Werke*, Bd. 1, p. 307, cit. in J.M. Paul, *Bachelard et Novalis : peut-on fixer des limites à ses rêves ?*, in "Cahiers Gaston Bachelard", n°11, 2010, pp. 61-77, DOI https://doi.org/10.3406/cgbac.2010.1088; "Vous êtes presque des astrologues renversés, dit l'ermite", translation E. Savorelli. Cfr. also M. Porro, Altri pensieri delle pietre, in "Doppiozero", 2023; https://www.doppiozero.com/altri-pensieri-delle-pietre (last access 01.09.25).
20 Ibid..; "Pour eux [i.e. les astrologues] le ciel est le livre de l'avenir, tandis que pour vous [i.e. les mineurs] la terre expose les monuments du monde primitif", translation E. Savorelli.
21 R. Caillois, L'écriture des pierres, Paris: Atelier EXB, 2015, p. 243; ; "Elles séduisent par une beauté propre, infaillible, immédiate, qui ne doit de compte à personne. Nécessairement parfaite, elle exclut pourtant l'idée de perfection, justement pour ne pas admettre d'approches, d'erreurs ou d'excès. En ce sens, cette beauté spontanée précède et déborde la notion même de beauté", translation E. Savorelli.
22 U. Stadler, Vedere meglio, vedere altro! La scienza e la poesia in rapporto all'esperienza visiva, trad. it. R. Gambino, dans "Cultura visuale. Paradigmi a confronto", cur. par R. Coglitore, Palermo: :duepunti edizioni, 2008, p. 103; "in estrema sintesi si potrebbe dire che la poesia non rivendichi, in fondo, un vedere meglio bensì un vedere altro", italics by the author, translation E. Savorelli.
23 G. Tonelli, *Genesi*, Milano : Feltrinelli, 2019, pp. 53-55.
24 B. H. Brockes, Das Irdische Vernügen in Gott, in Id., "Auszug der vornehmsten Gedichte aus dem Irdiscen Vernügen in Gott", Stuttgard: Metzler, 1965, pp. 1124 ss.; cit. in U. Stadler, Vedere meglio, vedere altro! La scienza e la poesia in rapporto all'esperienza visiva, it. trans.. R. Gambino, in "Cultura visuale. Paradigmi a confronto", cur. by R. Coglitore, Palermo: :duepunti edizioni, 2008, p. 105; "La splendida struttura del mondo la vede, purtroppo! Ognuno [o ognuna, aut.], / attraverso il cannocchiale capovolto delle proprie passioni, / cos. che tutto, tranne s. stessi [o se stesse, aut.], rimpicciolisce e s'allontana, / cos. che s'impara ad ingrandire unicamente s. stessi [o se stesse, aut.]".

Rocks of the Origins: Stromatolites

by Pierre Sans-Jofre

Stromatolites are fascinating laminated rocks whose formation in marine environments was induced or influenced by the activity of microorganisms, primarily bacteria. These structures play a crucial role in the history of our planet, as they represent the earliest bioconstructions on Earth. Today, they are used both as evidence of the oldest traces of life on Earth and as key agents in major atmospheric oxygenation events, having contributed to transforming our environment billions of years ago.

Formation of Stromatolites

Stromatolites are often composed of carbonates and host a complex bacterial ecosystem, notably including photosynthetic cyanobacteria. The metabolic activity of these microorganisms alters the chemistry of the surrounding water, leading to the precipitation of so-called authigenic minerals, such as carbonates. The organic matter produced by these bacteria covers the structures and contributes to their growth by trapping detrital particles.

Stromatolites display a wide variety of forms: planar, conical, or domal laminations, such as those observed at Shark Bay in Australia. These forms are often interpreted as the result of growth oriented toward a light source, which is essential for cyanobacterial photosynthesis.

An Ancient and Valuable Biosignature

These rocks appear in the sedimentary record more than 3 billion years ago, making them one of the oldest biosignatures in the world. They testify not only to the emergence of life on Earth, but also to its evolution and its impact on the environment. Stromatolites thus offer a unique window into the biological and geochemical processes that have shaped our planet.

By studying these structures, scientists can better understand the environmental conditions of the Earth's earliest ages and the mechanisms that enabled the emergence and development of life. Stromatolites therefore remain an essential subject of study for exploring the origins of life and the history of our planet.

Active Research at the Museum

At the French National Museum of Natural History in Paris, we house the largest collection of stromatolites in the world—geological treasures that tell the story of our planet. These sedimentary formations, witnesses to the Earth's earliest ages, are studied across different temporal and spatial scales, offering a unique perspective on their evolution and their role in the history of life.

Stromatolites lie at the heart of multidisciplinary research, bringing together biologists, geologists, chemists, and many other specialists. They constitute a fascinating object of study for exploring the mechanisms that enabled the emergence and development of life on Earth. Through this research, we seek to unravel the mysteries surrounding the origins of life and to better understand how these structures influenced the evolution of our planet. In short, stromatolites are not merely ancient rocks: they are living archives that continue to inspire and guide our quest for knowledge about the beginnings of life.

An Art–Science Project on the Origins of Life and Humanity

The specimens entrusted to Matylda share a common characteristic: they are rocks that bear witness to the presence of primitive life while containing valuable information about ancient environments, sometimes more than two billion years old. Through her meticulous work and artistic eye, Matylda has shaped and transformed these rocks in ways that reveal details or sedimentary layers that would otherwise go unnoticed. The connection she establishes between the rock, its country of origin, and the myths surrounding the origins of life and humanity is particularly original. This approach allows the public to be engaged on multiple levels—cultural, artistic, and scientific.

Take, for example, the specimen from England, depicting two women seated and engaged in peaceful conversation. They are positioned on a sedimentary layer that records a major biological mass extinction that occurred 200 million years ago: the Triassic–Jurassic extinction. This crisis led to the disappearance of more than 20% of marine species.

The contrast between these two women—exchanging thoughts about the world or seeking to reinvent it—and the brutal reality of mass extinction reminds us of the fragility of the biological world. It also underscores the importance of collective efforts and calm dialogue in achieving lasting harmony between humanity and its environment.

Through her work, Matylda thus invites us to reflect on our place in the history of the Earth and on the necessity of preserving the fragile balance of life.

Photographs from the residency



Matylda Tracewska, Eleonora Savorelli, Jardin des Plantes



Matylda Tracewska, Eleonora Savorelli, Jardin des Plantes



Submarines of the Muséum national d'Histoire naturelle



Matylda Tracewska, Pierre Sans-Jofre, *submarines*



Pierre Sans-Jofre, *submarines*



Pierre Sans-Jofre, *submarines*



Sylvain Bernard, Matylda Tracewska, IMPMC laboratory



Pierre Sans-Jofre, Matylda Tracewska, IMPMC laboratory



Matylda Tracewska, the residency studio



Matylda Tracewska, the residency studio



Matylda Tracewska, the residency studio



Eleonora Savorelli

Works



Location: Moodies Formation, South Africa
Approximate age: 3.2 billion years
Type: banded iron formation (BIF)
Sampled: 2017

Umvelinqangi / Unkulunkulu
2025
BIF, stone and glass mosaic,
cement mortar, mineral paints
50 x 50 cm

The oldest stone on display was collected from the Moodies Group, a geological unit that contains the oldest known tidal deposits on Earth, of detrital origin. In its upper sections sandstones are found, formed from consolidated sands 3.2 billion years ago. They contain preserved organic matter, resembling filamentous structures, which has been proposed as evidence of early life. Above this unit lies a banded iron formation (BIF). The specimen is potentially magnetic; its white bands are quartz, a chert composed of pure silicon dioxide and the red coloration is attributed to a mixture of magnetite and hematite.



Location: Pongola, South Africa
Approximate age : 2.9 billions years
Type: banded iron formation (BIF)
Sampled: 2022

Unkulunkulu
2025
BIF, mineral paints, oil paints
9,5 x 10 x 1,7 cm

This stone was collected in 2022 from a quarry near the Umfolozi River, South Africa. The quarry comprises stromatolitic structures, underlain by so called banded iron formations (BIF) characterized by a high concentration of iron oxides. Banded iron formations are sedimentary rocks consisting of alternating layers of iron oxides and chert. These formations record the oxygenation of the Earth's oceans, as the result of oxygen production by photosynthetic cyanobacteria. This sample of BIF is significantly altered.

According to a Zulu myth about the creation of humankind, the Earth was initially inhabited by darkness and consisted of lifeless rock. In this darkness dwelled Umvelinqangi, whose voice was so powerful that it caused seaquakes when in anger. One day, they created a small seed and sent it to Earth. Resting on the ground, it gave life to a long cane, which in turn gave birth to other seeds and other canes, until a large swamp called Uthlanga was created.

At the end of a reed grew a man, Unkulunkulu, known as "the first ancestor" or "the Great One." At first very small, he grew to such an extent that he broke the reed. Walking through the land of Uthlanga, he noticed that other human beings were sprouting from other reeds and gathered them, giving life to the ancestors of all peoples.

The Great One continued walking among the reeds and saw different forms of life growing at their ends. He gathered the fish and threw them into the rivers; the fields and forests began to grow, so he gathered birds and antelopes, which he released into the wild; he tore lions and other beasts from the reeds, which would travel the lands in search of prey. He tore a ball of fire and a round, shining stone from the reeds and threw them into the sky. These were the Sun and the Moon: light entered the world.

One of the last actions performed by the Great One was the most tragic. He plucked the first chameleon from a reed and sent it to humans with the following message: "Humans must not die", so that they could become immortal. The chameleon was slow on its journey, and the Great One grew impatient. He sent a lizard, which was much faster, to deliver the news quickly, but it made a mistake and said, "Humans must die". From that day on, humans became mortal, and it is said that chameleons change color because they are ashamed that their ancestor was not fast enough to spare humanity from the invention of death.



Location: Richat Structure, Mauritania
Sample equivalent: Gg 2021-307
Approximate age: ca. 8000–7000 years
Type: columnar stromatolite

The Emergence of Humankind
2025
stromatolite, oil paints
6,5 x 6 x 4,5 cm

Richat Structure, commonly referred to as the "Eye of Africa", is a circular landform with a circumference of 30 km, formed by magmatic processes. It has become the subject of many legends and myths, the most famous of which is the one of Atlantis, believed to have been located precisely in this site. This area is also notable for the abundance of archaeological artifacts.
The white part of the stone is stromatolitic. It displays several distinctive chemical anomalies and is enriched in rare earth elements and metals. It is among the most finely laminated in the collection, with delicate tiny cones. Its radiocarbon dating indicates a period during which the Richat crater was inundated with water. The composition of the non-stromatolitic, maroon-coloured section, remains uncertain. The sample bears evidence of desert weathering, where strong winds and fine, abrasive dust erode the surface of the rock, producing a characteristic patina.



Ites and Tamettant
2025
stone and glass mosaic, smalti, cement mortar, mineral paints
50 x 50 cm

The oral tradition of the people of the Fuguig oasis holds that human beings, like desert truffles, are born from the subsoil, from the union of lightning, earth, rainwater and wind. The colors of human skin would correspond to the colors of the truffles found in this region, ranging from black to red, yellow to white.

Another Berber tale describes the birth of Sleep and his sister Death. Here is the full version: There was a boy and a girl. Their names were Sleep and Death. They were good to each other. Before, men never died, and they remained that way until the day the Great King (God) summoned Death [Tamettant] and his brother Sleep [Ites]. After all, we always say that sleep is the brother of death. When they arrived at his house, he told them that human beings were immortal but did not follow his guidance, they strayed from it, and for this reason he decided to kill them. He entrusted Sleep with the task of killing men and Death with that of killing women. He began with Sleep, whom he sent first.

However, since Sleep was sensitive to the suffering of others, he captured a first man at sunset, forced him to bed, but let him go as soon as the sun rose and the man got up; nothing happened to him. The man did not die. He did the same with a man he captured at noon, but shortly afterwards he let him go. God called him and was angry with him: “I told you to kill men, not to let them live!” Sleep replied, “I am sensitive to the suffering of others, I dare not kill men who work!”.

Death did not refrain from shouting, “I have only one brother, but God created him clumsy!”. God then sent Death, but this time to kill both women and men. She was ruthless! He instructed her to kill whomever she wanted, whenever she wanted and wherever she wanted. She descended from heaven to earth and from that day on began to kill whomever she desired: young, old, male, female, newborns, sick or healthy... She no longer let anyone live forever as before!

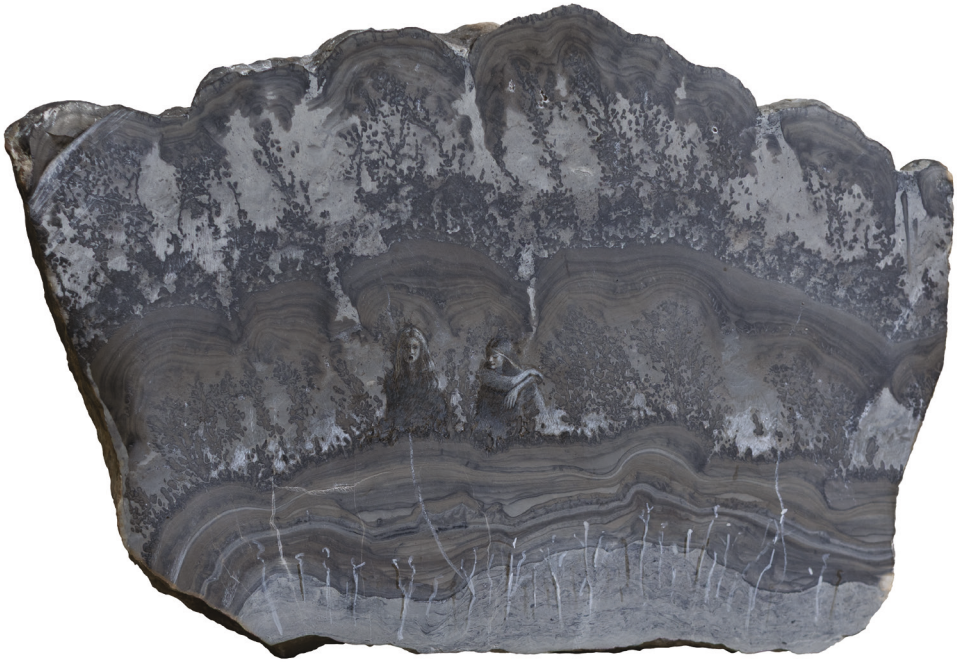
And so it was that human beings became mortal.



Untitled
2025
unknown pseudostromatolite, stone mosaic, mother of pearl, cement mortar
30 x 30 cm

The morphologic provenance of this sample remains uncertain; it was sourced as the others from the collection of loose blocks labeled as pseudo and false stromatolites.







Location: Bristol, Great Britain
Equivalent of the sample: Gg 2021-56
Approximate age : 205 million years
Type: Cotham marble, Penarth Group

previous page (left)
The Creation of Valinor
2025
Cotham marble, stone mosaic
14,5 x 27 x 1,5 cm

previous page (left)
Yavanna and Nienna I
2025
Cotham marble, oil paints
18,5 x 26 x 3

previous page (right)
Yavanna and Nienna II
2026
stromatolite / Cotham marble, mineral paints, oil paints
7 x 11,5 x 2 cm

Although described as a variety of Cotham marble or landscape marble and often found in association with it, this stromatolitic limestone has a different origin. It consists of thin limestone flakes often set almost on edge within a sandy limestone. It is named after Cotham House in Cotham, Bristol, and was used for ornamental purposes, particularly during the Victorian era. On cut and polished faces the stone has the appearance of a landscape, complete with ploughed fields, trees, and hedges. Due to its decorativeness Cotham marble has been mainly used to produce ornaments for display and as inlay in furnishings, such as tables and chimney pieces.

In The Silmarillion, a collection of myths published posthumously in 1977, Tolkien writes: "And when Valinor was full-wrought and the mansions of the Valar were established, in the midst of the plain beyond the mountains they built their city, Valmar of many bells. Before its western gate there was a green mound, Ezellohar, that is named also Corollairë; and Yavanna hallowed it, and she sat there long upon the green grass and sang a song of power, in which was set all her thoughts of things that grow in the earth. But Nienna thought in silence, and watered the mould with tears".









Location: Teyran - Saint-Drezery, Montpellier, Hérault, France
Sample equivalent: Gg 2021-48
Approximate age : 40 millions years
Type: oncoid

previous page (left)
Eiocha I
2025
stromatolite, mineral paints
11 x 26 x 2,5 cm each

previous page (right)
Eiocha II
2026
stromatolite, oil paints
6,5 x 8,5 x 4 cm

The white oncoids are entirely rounded, spheroidal stromatolites, ranging in this area from 5 to 20 cm in diameter. When sectioned, they reveal well-defined stromatolitic laminations accompanied by a thrombolitic aspect. Due to their spherical shape, the process of their growth remains uncertain. It is unclear whether they floated in the water at the time of formation, or if they formed while lying in shallow-water mud and were periodically moved or overturned by waves or wind.

The Celts, called Gauls by the Romans, dominated the area of present-day France from the first millennium BC until the conquest of the same lands by the Roman Empire, carried out mainly by Julius Caesar between 58 and 50 BC. The Druids, the priestly, intellectual, and legal class of the Celtic peoples, played a central role as repositories of wisdom, guarantors of tradition, and guardians of divine and natural powers in the areas of present-day France, Great Britain, and Ireland.

In 2002 in New York, based on available information, a Druidic cosmogonic myth was recreated, which tells that in ancient times, when time did not yet exist, a white mare made of sea foam was born at the point where the sea met the land. Her name was Eiocha. Not far from there grew a strong and sturdy oak tree – a cosmic tree connecting the earth to the sky, a symbol of abundance sacred to the Druids – and above it a mistletoe plant, whose berries were born from the tears of the sea foam. Eating these white fruits, Eiocha became pregnant and gave birth to the god Cernunnos, associated with fertility, abundance, and regeneration.



Location: Orbagnoux, Corbonod, Ain, France
Sample Equivalent: Gg 2021-60
Approximate age: ca. 157 million years
Type: columnar stromatolite
Sampled: 2016

Donn and Danu
2025
stromatolite, metal leaf mosaic, cement mortar, mineral paints
39,5 x 62,5 cm

Dating to approximately 157 million years ago, this bituminous carbonate sample is interpreted to be of marine origin. When scratched, it emits a characteristic petroleum-like odor due to its bitumen content.

Among contemporary interpretations of Celtic myths is that of creation through the first great love story on earth: that of the goddess Danu and the god Donn. Long ago, before the worlds came together, there was nothing but the Void, which, as time passed, began to yearn in its torpor. Desire led it to reflect on the surrounding chaos so intensely that the Void fell into a deep sleep and had a vision. In this vision, it was shown the beauty of how all things that were to be could be.

So great was the love that the Great Void felt for what it had seen that it divided itself, giving birth to two children, Danu and Donn. The sacred flame that burned in the Void also ignited in their hearts, and they remained locked in an embrace of love from which they could not break free.



Location: Woman Lake, Canada (Red Lake Area Ontario)
Sample equivalent: Gg 2021-96
Approximate age : ca. 2.8 billion years BP
Type: linked-columnar stromatolite
Sampled: 2017

Nanabush and the Muskrat
2025
stromatolite, cement mortar, mineral paints
70 x 35 cm

This linked-columnar stromatolite dates back approximately 2.8 billion years, indicating its formation in a marine environment. The samples were provided by Pierre Sans-Jofre, who collected them during a field expedition in 2017. The stones were extracted directly from the Woman Lake during a boat-based sampling.

In the beginning, according to Ojibway storytellers, an indigenous people of Canada and the United States, before the world we live in today was created, the first animals and the powerful wizard Nanabush, capable of transforming himself into other beings, lived in an older world. In the ancient world, Nanabush and his younger brother lived on the shore of a lake. They played with birds and animals and were friendly with everyone except the evil Serpent people. The Serpent people lived underwater and tried to kill Nanabush's animal friends. They were also capable of flooding entire areas of dry land.
Nanabush and the Snake People often fought, and it was because of one of these clashes that the wizard created our world. One winter day, Nanabush's brother was killed by the Snakes. Through a stratagem, the wizard managed to enter the home of the Snake People and, by killing their leader, avenged his brother's death. When the Serpents realized what had happened, they raised the water level and flooded the entire Earth. The wizard escaped, along with his animal friends, to a hill where he had hidden a large raft.
Nanabush, the birds, and the animals remained on the raft for many days and nights. The wizard thought the water would soon recede, but then he realized that the old world was submerged forever and that the Snake People had drowned with it. The wizard himself would have to find a way to create a new world. So he called upon several birds and animals, skilled swimmers, including the loon and the beaver, but they had no luck.
"Muskrat!" exclaimed Nanabush, "you must try now". The muskrat dived in and stayed underwater for a long time, then suddenly reappeared on the surface, exhausted. Nanabush noticed that the little animal was holding one paw tightly closed and, opening it, saw tiny grains of wet sand. The muskrat had reached the old world. Nanabush took the grains of sand and dried them carefully, shaping them into a small ball on which he breathed lightly. He gently planted the ball in the water and commanded it to grow, thus creating the world we live in today.



Location: Boulogne, Carrière du Boulonnais, Mitry Mory, Seine-et-marne, North of France
Sample equivalent: Gg 2021-50
Approximate age: 350 +/- 10 million years
Type: domical and hemispherical stromatolite
Sampled: 2018

Ovum Anguinum
2026
stromatolite, mineral paints, oil paints
14 x 33 x 20 cm

This sample comes from a Napoleon quarry that is still exploited to make train station floors in France. For example the floors of Gare d'Austerlitz, Gare de Lyon (both in Paris) and Gare de Brest are made of these same carbonates. This formation is made of dolomite and has a small content of magnesium in it.

Pliny the Elder's *Naturalis Historia* (Natural History) is the only ancient text in which explicit mention is made of ovum anguinum, the serpent egg of the Gauls:
"There is also another kind of egg, of much renown in the Gallic provinces, but ignored by the Greeks. In the summer, numberless snakes entwine themselves into a ball, held together by a secretion from their bodies and by their spittle. This is called anguinum. The Druids say that hissing serpents throw this up into the air, and that it must be caught in a cloak, and not allowed to touch the ground; and that one must instantly take to flight on horseback, as the serpents will pursue until some stream cuts them off".
Today we know that the serpent's egg, considered a powerful talisman, was a fossilized sea urchin, and many specimens have been found in archaeological burial sites, confirming its importance in Celtic worship. One theory suggests that the cult of the ovum anguinum is connected to a cosmogony centered on the concept of the cosmic egg.



Location: Boulogne, Carrière du Boulonnais, Mitry Mory,
Seine-et-marne, North of France
Sample equivalent: Gg 2021-50
Approximate age: 350 +/- 10 million years
Type: domical and hemispherical stromatolite
Sampled: 2018

Phanes
2026
stromatolite, oil paints
13 x 17 x 10

This sample comes from a quarry that has been used by SNCF company to pave train station floors in France. For example the floors of Gare d'Austerlitz, Gare de Lyon (both in Paris) and Gare de Brest are made of these carbonates. This formation is made of dolomite, a calcium magnesium carbonate.

According to Orphic cosmogony, Phanes is the primordial god of creation, an incorporeal cosmic being that existed before the creation of the universe and that created all other gods and beings. The beginning of the universe starts with Phanes – whose name comes from the ancient Greek and means "bring to light" or "make appear" – being hatched from the world-egg. The god is described as a beautiful, golden-winged, hermaphroditic deity wrapped in the coils of a serpent.
Called "Fabricator Mundi" in Ovid's *Metamorphoses*, Phanes reorders the world: "Ere land and sea and the all-covering sky were made, in the whole world the countenance of nature was the same, all one, well named Chaos, a raw and undivided mass. [...] This strife a God [probably Phanes], with nature's blessing, solved; who severed land from sky and sea from land, and from the denser vapours set apart the ethereal sky; and, each from the blind heap resolved and freed, he fastened in its place appropriate in peace and harmony".





Location: Malmani, South Africa
Approximate age: 2.5 billions of year
Type: domal stromatolite
Sampled 2021

previous page (left)
The Queen of Death Valley I
2026
stromatolite, oil paints
16 x 15 x 10 cm

Location: Mojave Desert, Las Vegas, USA
(close to the Death Valley)
Sample equivalent: Gg 2021-11
Approximate age: 635 million years
Type: columnar stromatolite
Sampled: 2016

previous page (right)
The Queen of Death Valley II
2026
stromatolite, mineral paints, oil paints
15 x 16 x 10 cm

This dolomitic sample testifies how carbonate deposited after the most catastrophic glaciation on Earth, that is the Snowball Earth. After that event, Earth experienced one weather and a greenhouse period with very warm weather. This formation thus explains how this glaciation paved the way for microorganisms. The stromatolitic part is the grey one, while the orange and yellow ones are the interlayer columns.

According to an ancient Shoshone legend, the Land of Fire or Valley of Death was once fertile and inhabited by the Timbisha people, who lived at the foot of the mountain, next to a large lake surrounded by lush vegetation. They were ruled by a beautiful Queen, vain and demanding, who desired a home larger and more beautiful than those of her Aztec neighbors. She enslaved her people, who initially tried to please her. As the years passed, the Queen began to fear that she would die before seeing the building completed and became increasingly demanding, even forcing her family to build it. One day, she whipped her daughter, the princess, who cursed the Queen and her kingdom before dying of exhaustion. Only then did the Queen realize how far her greed had taken her, but her regret came too late. The earth began to turn against her, punishing her for her wickedness: the sun became hotter and hotter, drying up the lakes and plants, and part of the Timbisha people starved to death, while the rest fled. The Queen was left alone with her unfinished palace, fell ill, and died. Legend has it that glimpses of the unfinished palace can still be seen at times.



Location: Tangará da Serra, Mato Grosso, Brazil
Approximate age: 635 million years old
Type: neo-proterozoic carbonate, crystal fans
Sampled: 2012

Nhanduruvuçu
2026
stromatolite, oil paints
5,5 x 8 x 1 cm

This sample was found in Mato Grosso. The formation testifies a calm and carbonate saturated environment that represents a warm time period that postdated one of the most extreme climatic crises that Earth experienced, the Marinoan Snowball Earth Event.

A Guaraní myth tells the story of Nhamandú or Nhanduruvuçu, the Father of All Things. He creates the universe through song: with every sound, a new star is born. After transforming himself into Tupã, the voice of the heart, the creator breathes spirit into the Earth. Tupã, aware of the great work to be done to shape the world, creates Nhanduruvuçu, the First Ancestor. Tupã asks him to complete his creation, but Nhanduruvuçu does not know how. Tupã orders him to reach the four horizons, for at each cardinal point he will find a guide from whom he will learn something. To the north, the First Ancestor stops in front of a stone.
"He observes it, greets it, and asks:
'What can you teach me about living on Earth'.
'Enter inside me', replies the stone, "and you will discover for yourself'.
Nhanduruvuçu allows the stone to absorb him, becomes stone, meditates motionless, with all the weight of his silence, savors the strength of the mineral, breathes its slowness.
He feels that it is a good thing.
He falls asleep and begins to dream, and in his dream he searches for the ultimate goal.
He sees that it is not to be a stone, and he awakens.
'I have given you everything I know', says the stone. 'Now you can resume your journey'.
Nhanduruvuçu thanks him and takes flight toward the south".

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