

Retour aux sources

ART CONNECTED TO THE LIVING WORLD

COUNTDOWN
TO THE 300 YEARS
OF RUINART HOUSE

1729
Ruinart
LA PLUS ANCIENNE MAISON
DE CHAMPAGNE



GETTING BACK TO OUR ROOTS

On the eve of its fourth centenary, Ruinart has chosen to combine art and artificial intelligence in an immersive, sustainable and self-contained installation that is driven by life itself.

In September 2029, Ruinart, the oldest champagne house, will be celebrating its 300th anniversary. Over the course of its rich history, it has fostered partnerships with artists such as Alphonse Mucha in 1896, and more recently taking part in the world's largest art fairs through an annual *carte blanche* programme, granted by Ruinart to a different contemporary artist each year. This project has enabled Ruinart to present its heritage, history and know-how from a series of innovative angles, through the vision and preferred medium of the chosen artist. In the lead-up to this important anniversary, Ruinart has commissioned a work of art from the Mouwad Laurier duo, entitled *Retour aux sources*, which brings data, artificial intelligence and the living world together in an immersive experience.

THE CONCEPT

The artistic project *Retour aux sources* is the brainchild of a pair of environmental artists known as Mouawad Laurier, and marks the beginning of the 10-year countdown to the 300th anniversary of Maison Ruinart on 1 September 2029.

The work takes the form of a root planted in an ancient crayère chalk cellar. The root listens to what is happening within its natural surroundings above, and immerses the audience in a visual and sound experience 30 metres below ground. Deep inside the earth, where there used to be an ocean, the audience is confronted with the physical and temporal character of humanity.

The root, endowed with sensitive intelligence, listens to the natural elements involved in the champagne production process through a device that uses complex artificial intelligence. It reminds us that human beings and nature are intrinsically connected.



THE ARTISTS

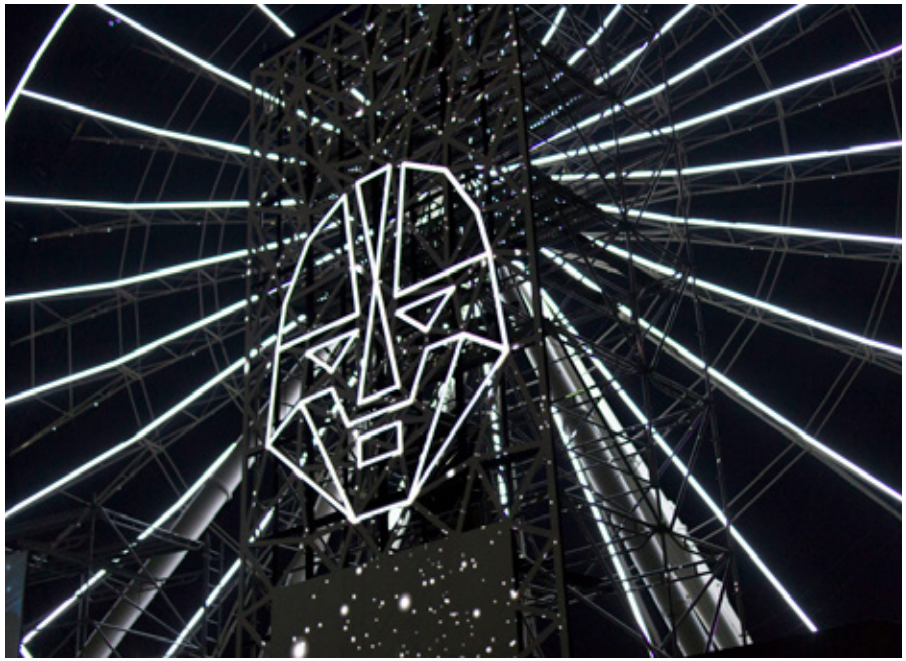
Mouawad Laurier is the collective name for two artists who work and live together. Maya Mouawad and Cyril Laurier have been collaborating on innovative artistic projects together around the world for many years, working with other artists under the name *Hand Coded*. They now sign their own work under their real names. In partnership with Pablo Valbuena, they were pioneers of video mapping and have continued along this path, collaborating with leading video mapping artists such as AntiVJ and Romain Tardy. They started using AI in 2006, and *Retour aux sources* combines elements of the work they have presented in the past.



THE ARTISTS
Maya Mouawad

Maya Mouawad focuses mainly on current environmental issues. Her work questions the role of machines in the modern world. How can these machines affect human behaviour? How can they change the way we perceive ourselves in relation to nature?

Her installations usually involve technological tools such as artificial intelligence, lights and generative sound. Working with Cyril Laurier, she co-created *Hand Coded,* a platform for developing tools and technologies for artists. She has also collaborated with many other artists such as Pablo Valbuena, Romain Tardy, Viktoria Modesta and Ezra.



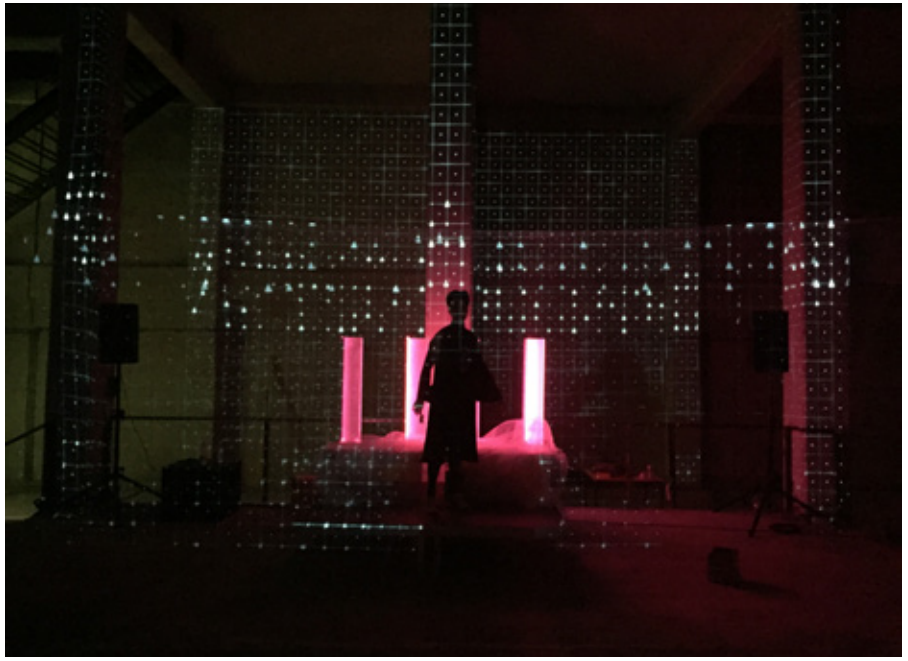


THE ARTISTS
Cyril Laurier

Cyril Laurier studied sound at IRCAM and then completed a PhD in artificial intelligence at the Music Technology Group in Barcelona. His research involved analysing emotion in music and was published in journals, books and conferences. He now applies his knowledge of artificial intelligence to art, notably questioning how humans interact with technology and nature.

As a musician, he is interested in generating new types of sound. He has developed tools for music labels such as Sony and Eventide, as well as for performers like Beardyman and Ezra.
This technology enthusiast tackles the issue from all angles, from the creation of electronic devices to the development of artificial intelligence software.







DATA

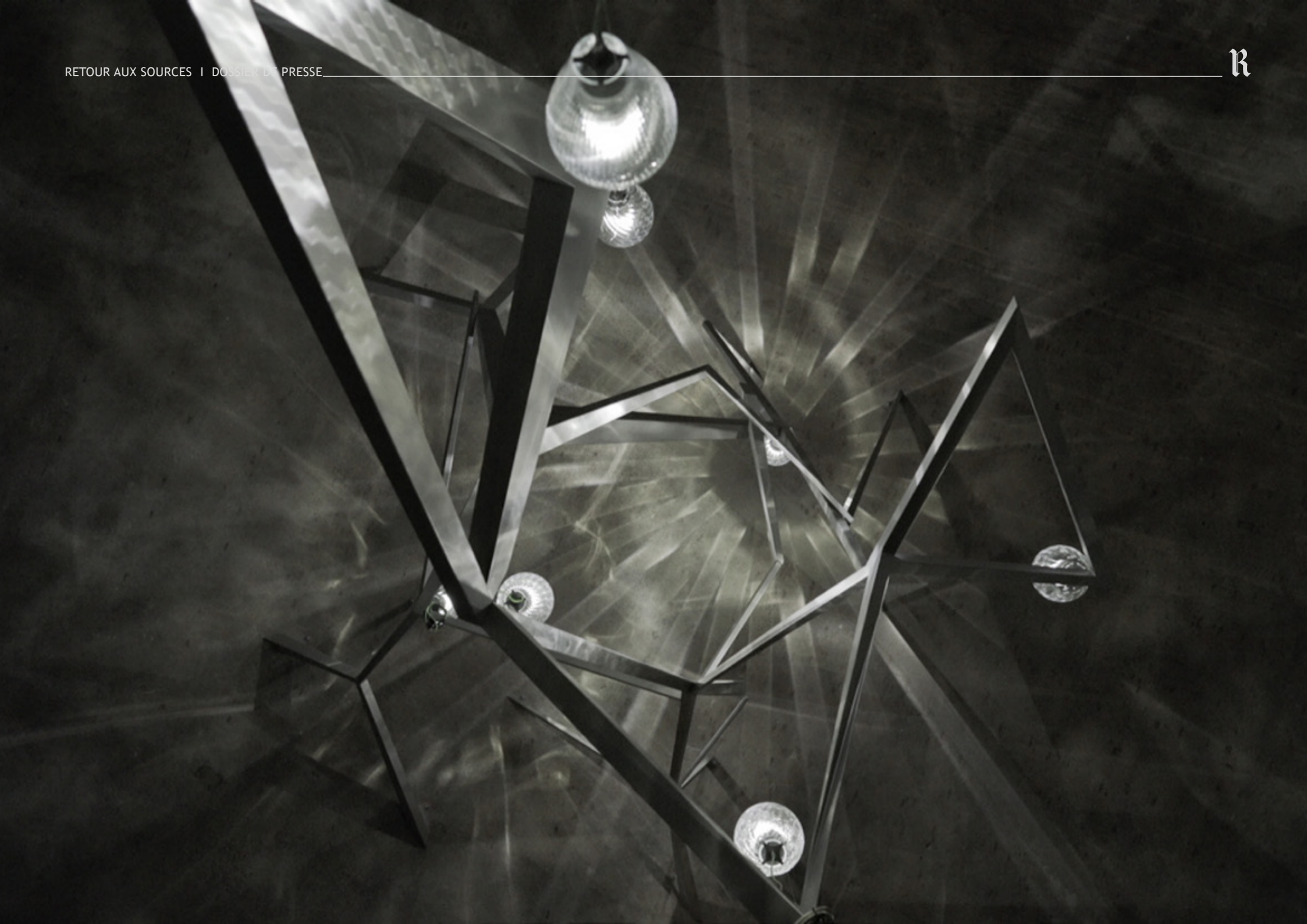
Retour aux sources is an autonomous entity that inhabits the crayère chalk cellar, and is able to perceive the world around it. It expresses the changes in seasons, climate, wind, and temperature, as well as the phases in winemaking including budbreak, harvest, fermentations, riddling, maturation, and so on, generating genuine emotion in the visitors who experience it.

Artificial intelligence techniques need data to exist. The root feeds on the data provided by the vineyard, wine production and climate. Depending on the season, the root will react in different ways to key indicators it is given.





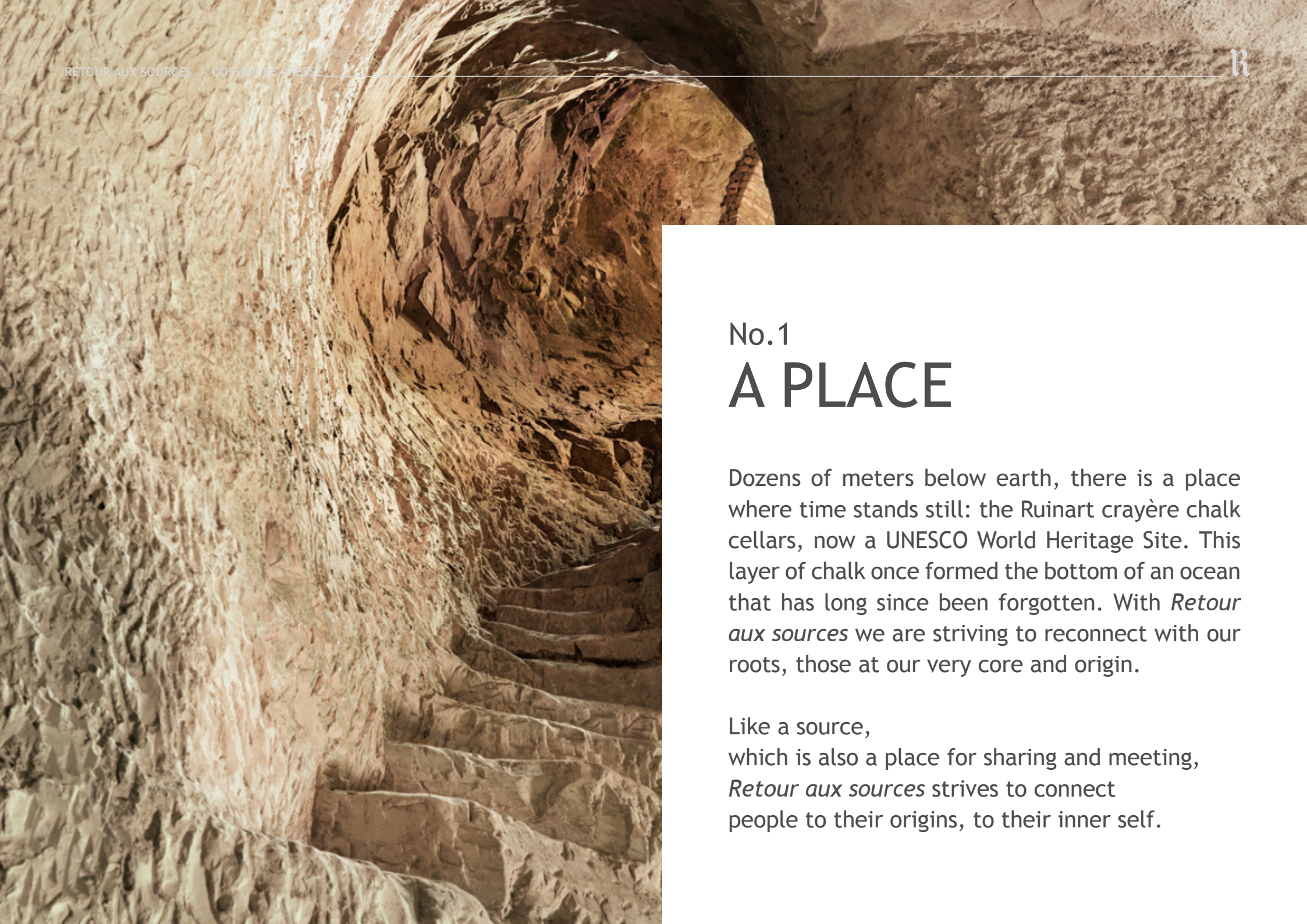






Back to the sources

THE 7 ELEMENTS OF THE WORK



No.1

A PLACE

Dozens of meters below earth, there is a place where time stands still: the Ruinart crayère chalk cellars, now a UNESCO World Heritage Site. This layer of chalk once formed the bottom of an ocean that has long since been forgotten. With *Retour aux sources* we are striving to reconnect with our roots, those at our very core and origin.

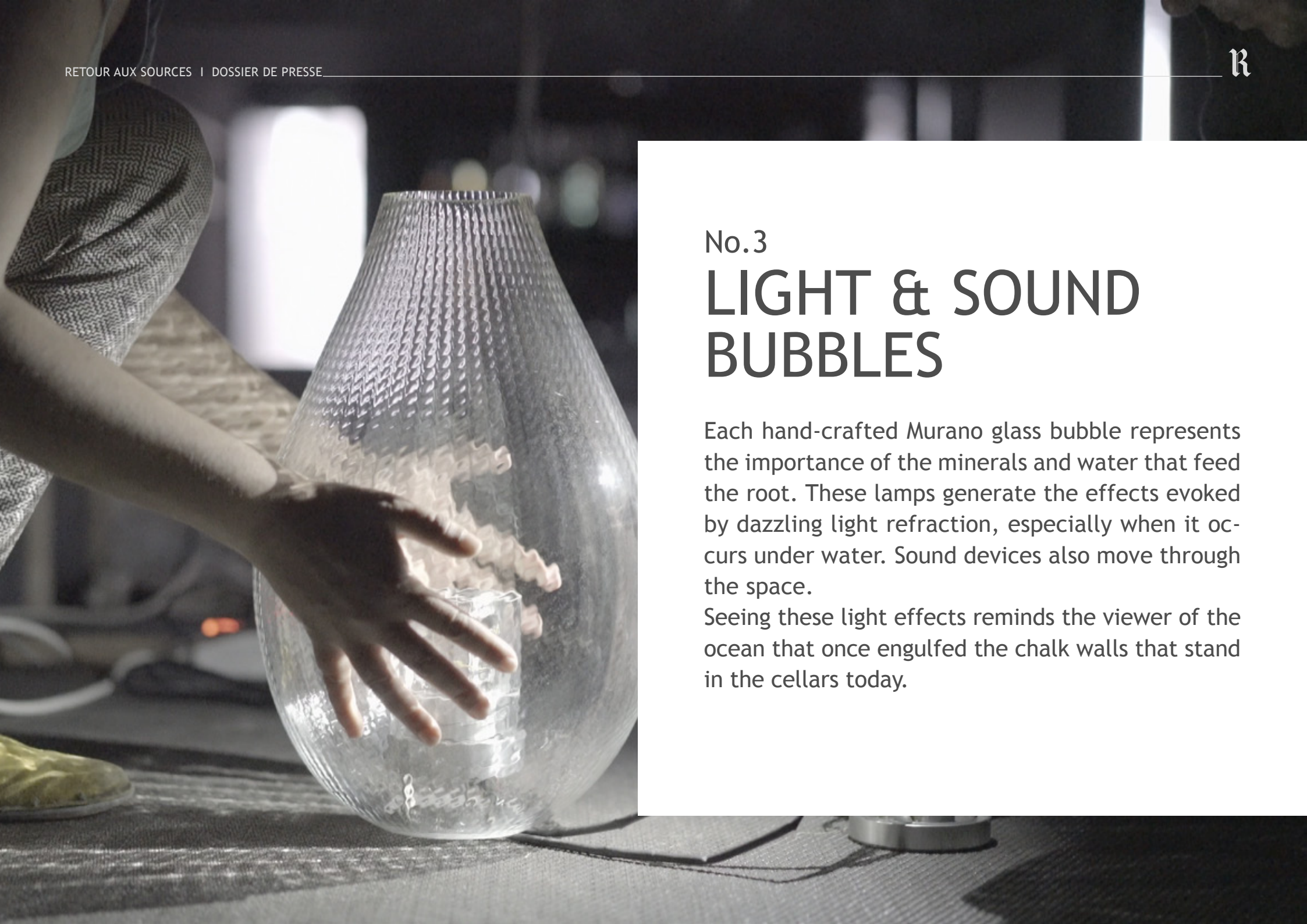
Like a source,
which is also a place for sharing and meeting,
Retour aux sources strives to connect
people to their origins, to their inner self.



No.2

A ROOT

A vine draws nutrients through its roots, acquiring all the minerals it needs to live. The root is also a complex network that offers vine plants a way to communicate among themselves. A root is therefore full of meaning. The sculpture presented here is of a root feeding on a network of neurons, and emphasises the conscious intelligence of nature. This root is planted in chalk, because the elegance of champagne and its complex flavours all derive from chalk.

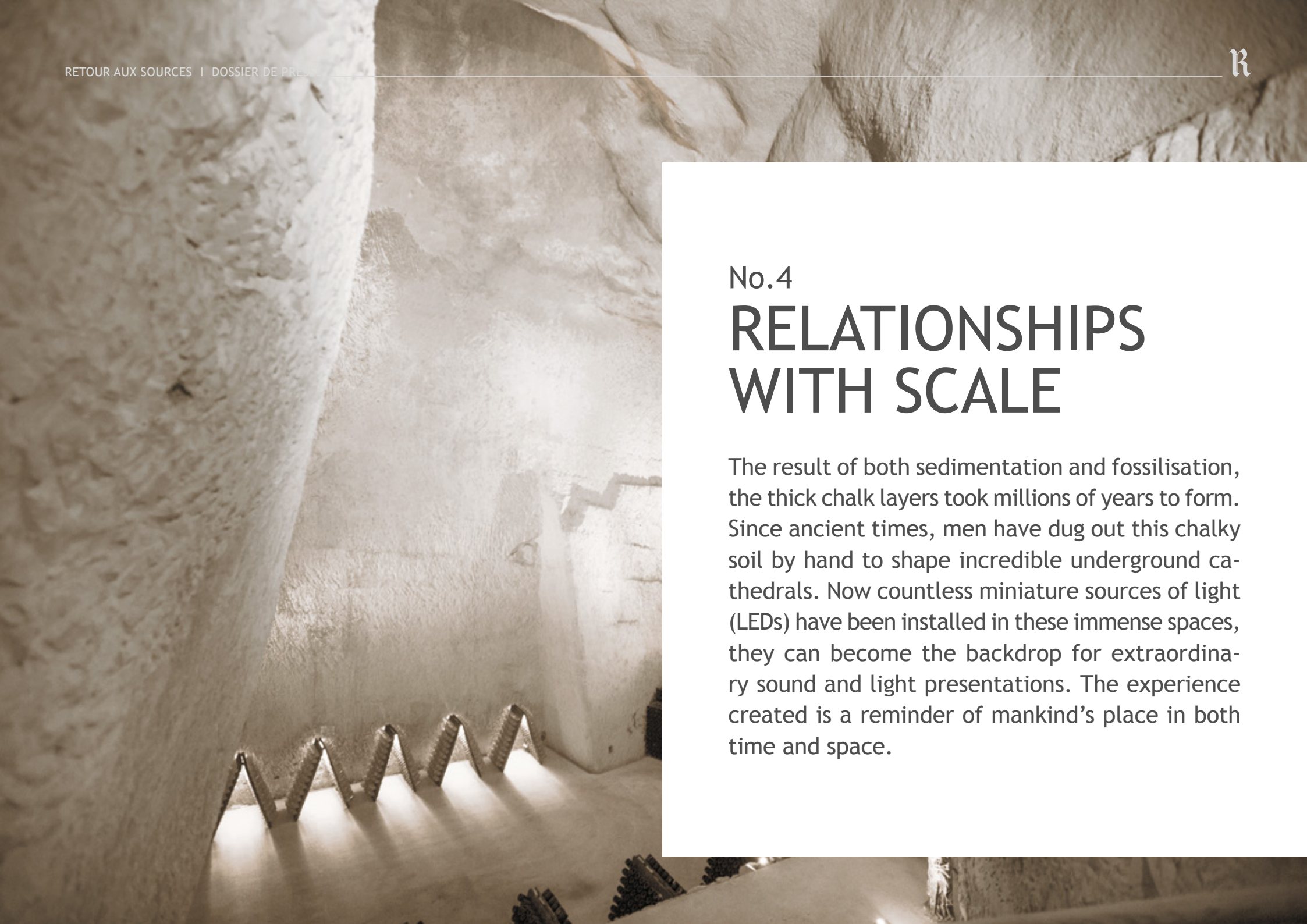


No.3

LIGHT & SOUND BUBBLES

Each hand-crafted Murano glass bubble represents the importance of the minerals and water that feed the root. These lamps generate the effects evoked by dazzling light refraction, especially when it occurs under water. Sound devices also move through the space.

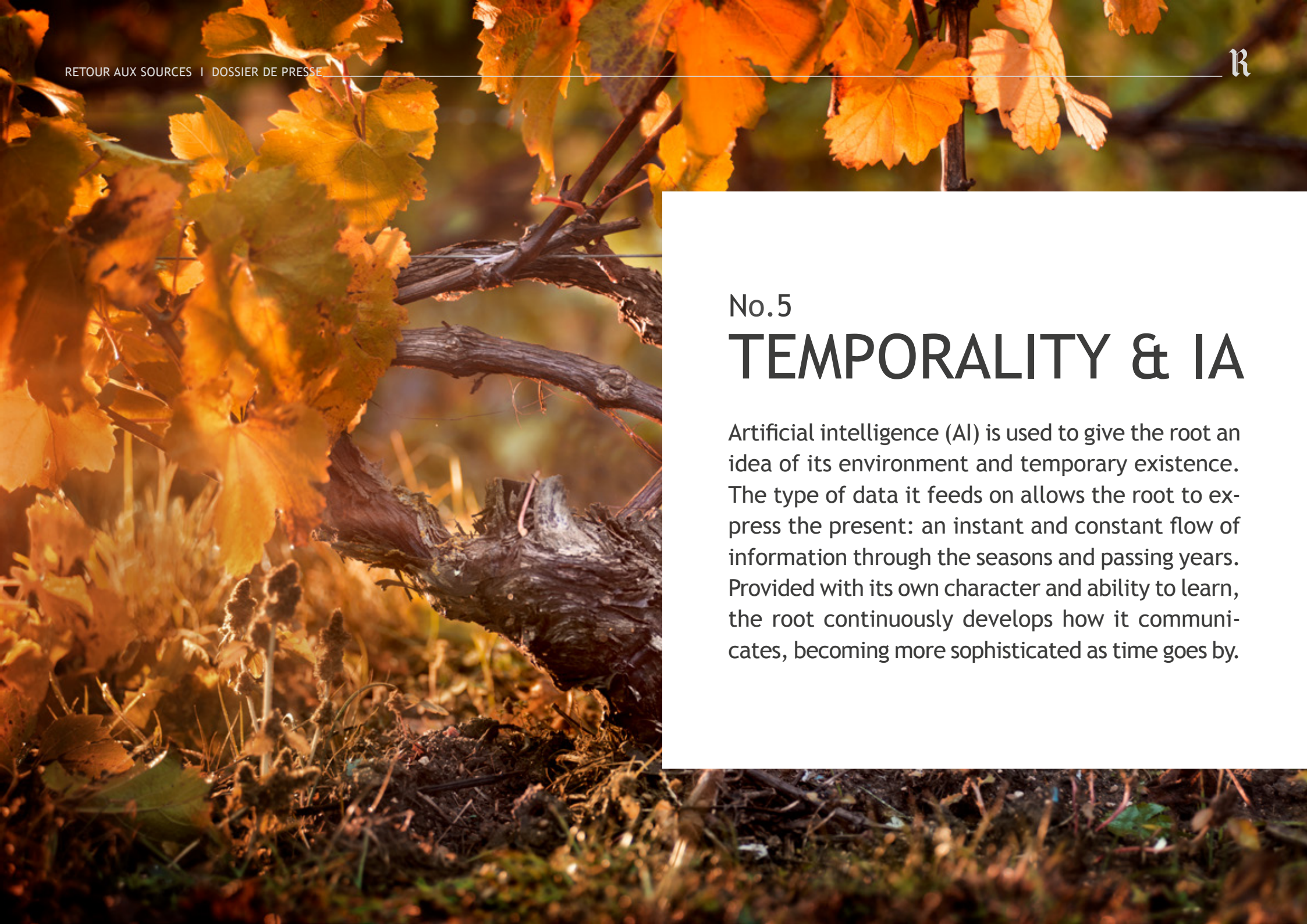
Seeing these light effects reminds the viewer of the ocean that once engulfed the chalk walls that stand in the cellars today.



No.4

RELATIONSHIPS WITH SCALE

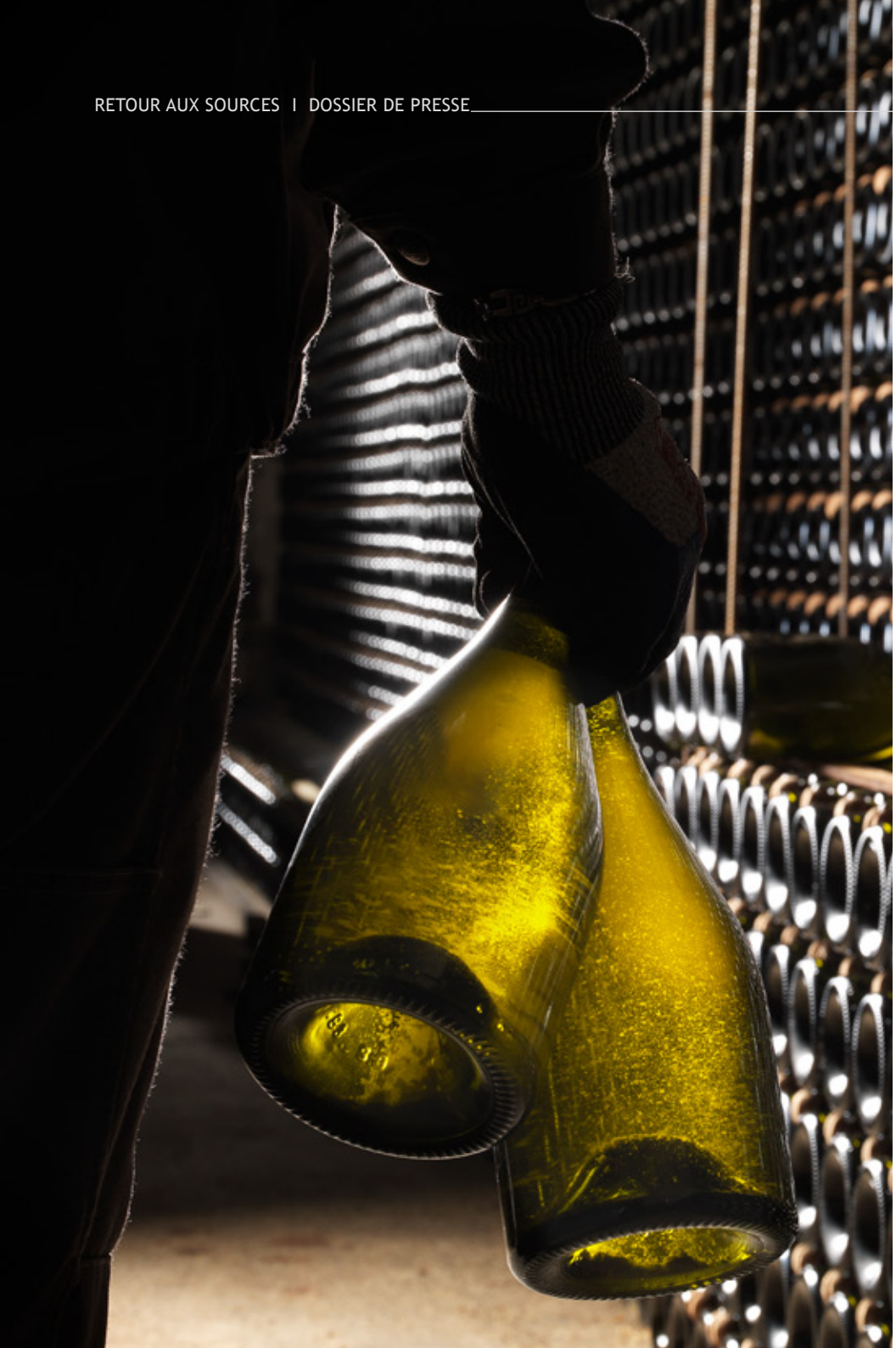
The result of both sedimentation and fossilisation, the thick chalk layers took millions of years to form. Since ancient times, men have dug out this chalky soil by hand to shape incredible underground cathedrals. Now countless miniature sources of light (LEDs) have been installed in these immense spaces, they can become the backdrop for extraordinary sound and light presentations. The experience created is a reminder of mankind's place in both time and space.



No.5

TEMPORALITY & IA

Artificial intelligence (AI) is used to give the root an idea of its environment and temporary existence. The type of data it feeds on allows the root to express the present: an instant and constant flow of information through the seasons and passing years. Provided with its own character and ability to learn, the root continuously develops how it communicates, becoming more sophisticated as time goes by.



No.6

DATA

The root feeds on data from the living world that it then expresses in its own way using light, colour and sound, as well as movement and rhythm. Its current state reflects what is happening around it, as well as outside, in the vineyards, tanks, cellars and bottles.
The root is connected to the Internet and a set of sensors, so it can analyse and synchronise with what is happening in its environment.

DATA USED

CLIMATE DATA
Humidity, atmospheric pressure, temperature, precipitation, wind

VINEYARD LIFE CYCLE
Budbreak, flowering, harvest, falling leaves

GRAPE RIPENING MONITOR
Potential degree of alcohol, acidity, berry weight, nitrogen concentration

FERMENTATION CONTROL
Density, temperatures

WINE MAKING
Prise de mousse, riddling, disgorging, examining, labelling

SITE VISITS
Number of visitors

TIME DYNAMICS
Ten-year countdown

The sound dimension is based on recordings of natural elements (wind, water, sounds from nature) and stages in the winemaking process (fermentation, riddling, etc.).



No.7

THE FRAGILITY OF THE LIVING WORLD

The root feeds on organic data from any given moment, comparing it with the data it already has stored. It provides its own interpretation of its current environment, whilst challenging how the onlooker perceives it.
When experiencing *Retour aux sources*, the viewer is encouraged to question the role of mankind within nature and how interdependent our ecosystems must be. *Maison Ruinart has purposefully chosen to embark upon a long-term sustainable development approach because it believes no human product really lasts unless it is created with respect for its environment*. This approach involved many fundamental components: from vineyard to winemaking, from waste management to green energy, from eco-designed packaging to shipping, not to mention the transmission of savoir-faire. *Retour aux sources* is one of many initiatives, in this case an artistic initiative, designed to develop awareness amongst a wider audience.

Retour aux sources

DATA AND ARTIFICIAL INTELLIGENCE



ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) is a source of intrigue, worry and fascination. It is described as the stake of the century [1], and it is predicted to have an impact as powerful as the invention of electricity [2]. It affects all sectors and all industries. Professions in which human beings were previously thought to be irreplaceable are now being overhauled by extraordinary technological progress. While certain fields are threatened more than others, the AI industry looks to be a game-changer for the future of business as we know it [3].

AI is also found in works of fiction; it offers myriad possibilities to the human imagination, especially because the very term “intelligence” suggests that it is innately human, rather than something we would associate with a machine [4]. It is important to understand that current techniques, as advanced as they are, are not intelligence in the sense of creativity, ability to innovate, be curious or invent. Nonetheless, AI can handle sophisticated algorithms to perform incredible feats and outsmart humans in a large number of tasks and domains that were until now only mastered by humans, and often only by experts (medical diagnosis, facial recognition, puzzles, fake videos, etc.).

Current methods are based on mathematics and statistics, and machines can only perform the tasks for which they were created. But the anthropomorphism of the technical terms used, such as AI, neural networks, synapses and others, feeds the fantasy that one day there could be an intelligent and conscious machine that might take control away from humans. For now, this is the stuff of science fiction and fairy tales, and often fails to address the properties and real consequences of these new technologies. We are already seeing certain effects in our lives where these “intelligent” algorithms make things easier for us in some ways, but also leave us dangerously addicted.
While some aspects of AI look to be very promising and useful, there is a risk that they could disconnect us from other humans, by delegating too much to machines, presuming they are the only truth, and cutting us off from the real world.

Humans can connect instantly with each other on social networks, no matter where they are in the world. But that also creates a feeling of distance with the world on our doorsteps. Don’t we sometimes prefer to find our way on a smartphone rather than ask a stranger?
The techniques we now have at our fingertips to optimise our work and provide us with personal assistance on a daily basis seem to be automating our society, keeping us at a distance from our environment. Many people already live in a world that is disconnected

ARTIFICIAL INTELLIGENCE

from nature, evolving in an urban landscape, controlling the temperature and light in their surroundings, living protected and often isolated from the weather outside. It is not uncommon for people to check what temperature it is outside on their phones, rather than opening a window to find out for themselves. We trust our senses less and less, and look more and more to the data generated by technology and algorithms. Unfortunately, this disconnect between humans and nature distances us from our awareness of the problems in our environment.

The *Retour aux sources* project is symbolised by the root, which connects our origins to the present time, and tries to educate us about a temporal and spatial scale that is greater than we are. It reconnects us with ourselves and with nature. It shows visitors all the natural and human elements that are important in the champagne production process.
The approach the artists have selected for this project is to push the cursor of experience as far as possible. In doing so, there is a reliance on the wonder and fascination inspired by artificial intelligence, while poetry and narration are created using local environmental and contextual data. AI is therefore the cornerstone of this dazzling artistic installation, which, through the latest technical advances, offers an immersive experience into nature and humankind.
This intelligent being is known as the root. It lives in chalk, and will be given emotions and an ability to perceive the world around it. It will be able to follow the changing seasons, feel the excitement of the highlights of the year, worry about climate change, perceive the wind [5], temperature, pruning, budburst, harvest, blending, riddling, fermentation, etc. It will be able to transcribe this data and its emotions to the visitors who come into contact with it.
AI techniques need data to exist. The root will therefore feed on these data from the soil and the champagne production process, through the climate. Depending on the seasons, the root will react in different ways to key indicators.

ROOT AND AI GENERAL FUNCTION

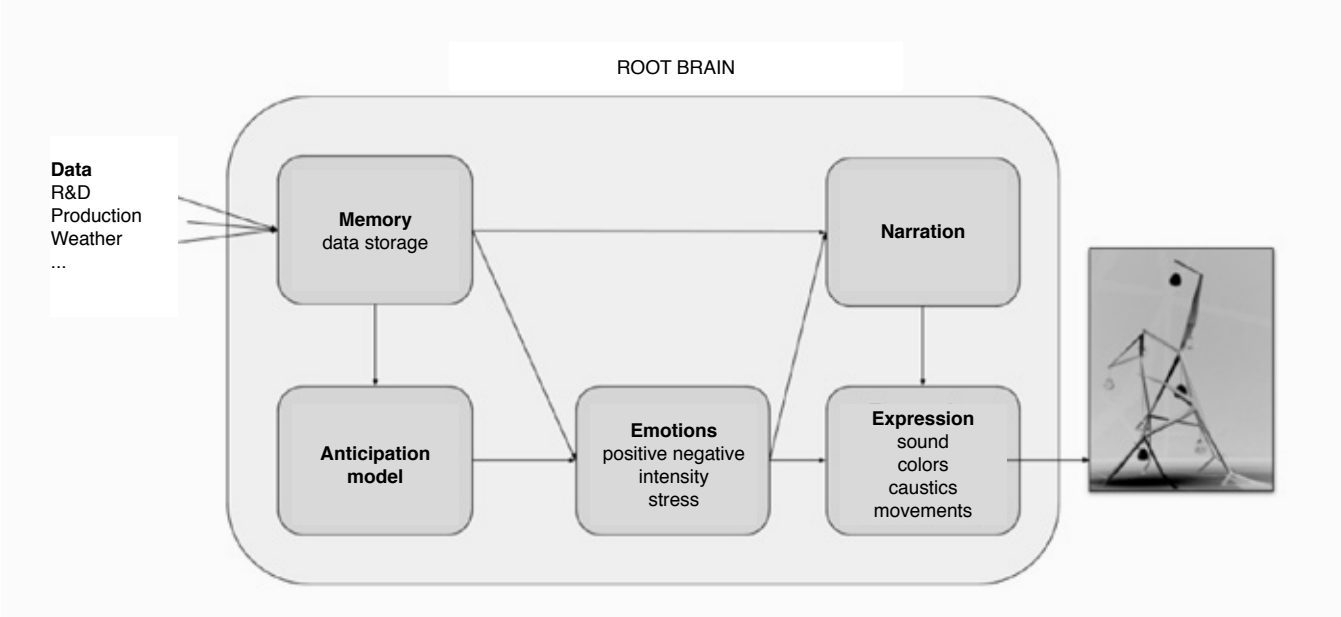
Retour aux sources will work in different ways, analysing its data in real time. As an entity with artificial intelligence, the root exists and evolves permanently by means of what is called the “brain of the root”. More specifically, this “brain” is inside the main machine, nestled in the chalk and can be securely accessed from anywhere through its connection to the Internet.
Ruinart’s *Retour aux sources* performance aims to create a rich and unique sensory experience for its visitors. It is now crucial to show respect for our environment. Three interactive and low-consumption modes have been defined.

• A meditative mode: the machine is at rest and receives information.

• A performance mode of about 4 minutes, which will present a summary of the root’s recent and current sensations, which are related to the vine’s life cycle and the data that is currently available.

• A longer show mode of about 8 minutes, representing a one-year cycle in stop motion [6].

Each interaction will therefore open up different perspectives on how the environment is evolving with regards to the chosen time scale: fast cycles, seasons, years.
It is also important to be able to understand and interpret the root’s expressions and emotions. The Ruinart teams will have analytical keys to perceive and interpret its actions. They will serve as guides to explain the symbolism of each element and will give meaning to this narration, drawing on the seasons and what is happening in the vineyards. They will highlight the root’s emotions in relation to current events.
In summary (see diagram of the brain below), the data stored in the root’s memory and the information it receives will feed a predictive model that will induce emotions depending on the context, for example if the data is normal, or positive, negative or reassuring or even disturbing. the root’s emotions will be directly influenced by significant data (bad weather, extreme temperatures, sunshine, etc.). These elements will influence what the root expresses, so its story will never be strictly speaking the same. Each performance will be unique.



RACINE AND L'IA - OVERALL FUNCTIONNING

DATA

The root will listen and feed on the following data:

Climate data: humidity, atmospheric pressure, real-time temperatures, min / max temperatures, wind speed, wind direction, precipitation, cloud cover (UV index), snow. This data will be received from the Ruinart weather station and OpenWeather data from Sillery.

Cycle of the vine: dates of budburst, flowering, harvest, when the leaves fall from the Chardonnay vines in Champagne; averages over the last 10 years, and updated information each year.

Monitoring grape ripening: potential degree of alcohol, acidity, weight of the berries, nitrogen concentration, information collected in the 3 weeks running up to the harvest.

Fermentation control: density, temperatures, data from measurements that take place 2-3 times a day from the beginning of the harvest and continue for about three weeks.

Winemaking process: *prise de mousse*, riddling, disgorging examining, labelling, data from production monitoring at the Ruinart site.

Visits: number of visitors to the site.

Temporal dynamics: How the root evolves over the ten years of the countdown.

The type of data to be used was chosen after discussions were held with each team and various experts, to understand which data best represents and is important during each period of the champagne cycle. The data will be refreshed in real time, so will express that particular moment, and its emotions.

EMOTIONS, ANTICIPATION AND EVOLUTION

The root will be given emotions that it will express through sound, light and movement. It can analyse data from the present in relation to data from the past (ability to forecast using the overall structure of the root's brain). The data collected describes situations that are repeated every day, month or season. An expected situation that corresponds to what the root already knows will calm it. Conversely, if the data is extreme and exceptional, it will react negatively. It will interpret the changes and react differently to good news according to the chosen criteria — sunshine when it lacks sunshine, or rain in case of drought — and to bad news such as excess rainfall or spring frost. The root will follow an emotional model in two dimensions:

- A positivity / negativity axis,
- An axis of intensity (calm / stress).

This approach is based on a standard model by American psychologist James A. Russell [7]: emotions vary over time, but our emotional models vary too. With new data, the root will have more elements to learn about and interpret the present.

NARRATION

The *Retour aux sources* performance for visitors will be linked to what is happening currently in the vine's life cycle, and in the champagne production process. The narrative will evolve constantly.

The idea is that the performance refers symbolically to the present, with for example a colour that will evolve according to the colour of the berries as they are ripening, with its intensity increasing every day up to the harvest. The frenetic activity during the harvest will be reflected by intense activity in the root, etc. The longer narrative will express what happens over a full year. The critical parameters for each period will influence what the viewer sees, the same goes for all the data about daily life at Ruinart (production), and also for the current weather conditions, in comparison with what has happened in the past. This way of symbolising climate change will highlight how important it is to respect nature and our fragile terroir.

UBIQUITY

The root's "brain" is the cornerstone of its ability to express itself. It is connected to the real world and the Internet. Beyond its expression in the Ruinart chalk, this same "entity" can give rise to other forms of expression in other places around the world, so the experience is portable.

EXPRESSION AND INTERPRETATION

The root expresses itself through:
• Bright or dazzling projections (intensity, movement, orientation),
• Movements of lamps in the space,
• Spatial and moving sound,
• Colours of the lights,
• Vibrations of the light,
• Structure of the root and its reflections and shadow.

The architecture of the chalk underscores the feeling of scale and becomes a hub of concentrated emotions. The isolation from light creates a context where a small glow can take on huge importance. This unique environment means that images and sounds are perceived with finesse and precision. The root's sound material will be composed of sounds that have been recorded in the vineyards as well as in the production site of Ruinart, and will be used directly or modified to imitate natural sounds. This produces an atmosphere that is sometimes organic, sometimes introspective, but also gives rise to the creation of rhythms and more musical and harmonic phrases. The integration of more or less filtered and dynamically retouched voice recordings of people working on the site brings a human element to the whole experience.

According to the root's emotions, some of the algorithms on emotion in the music developed by Cyril Laurier [8] will allow the "brain" to choose the corresponding sounds. The visuals and movements of lights and lamps will follow the narration and sound generated for each performance. For example, there will be a sequence during budbreak that symbolises the bud as it emerges from the cane. The lamps on the root will illuminate one after the other in a more or less intense rhythm depending on the speed of budburst. Similarly, as they ripen, a performance sequence will symbolise the growth of the berries; the lights coming from above represent the intensity of the sun; and the changes in the colour of the lamps on the root symbolise the developments in the colour of the grapes.
Aesthetics and coherence shouldn't only be figurative though, it is important to have certain direct and intelligible elements. Balance will be ensured by keeping the sensations subtle and delicate, in line with a constructed narrative that creates a rich and poetic spectacle.

TEMPORALITY 300 YEARS

The work *Retour aux sources,* through its memory of data, its updating in real time and its awareness of the champagne production cycle, offers a long-term vision. Its expression will evolve as it accumulates more knowledge. It has already been fed data from the last 10 years and will learn from the next 10 years, until Ruinart's 300-year anniversary. This notion of temporality is also borne out on different scales: for instance the current weather, period or season with data relating to the point in the annual cycle, and finally the current year in comparison with past years.
This project aims to celebrate 290 years of Ruinart, and marks the beginning of the countdown to 300 years. It is therefore important that the work is to some extent aware of this event and can express that awareness. Over the next 10 years, and given climate change predictions, it's a safe bet that weather conditions will continue to deteriorate, and that the root will pick up on these changes. In nature, plants can defend themselves, they seek out solutions. The root will be there to warn us, to tell us what's going on and what is to come. And perhaps it will be able to share that awareness with the people who come to visit it, underlining the fragility of nature and how terribly urgent it is that we preserve it.

NOTES

[1] Artificial intelligence or the stake of the century, Éric Sadin, 2018. Éditions L'Échappée.

[2] Artificial Intelligence is the new electricity, Andrew Ng. VP & Chief Scientist of Baidu.
Co-founder of Google Brain.

[3] 2018: $7 billion. 2025: $89 billion
Source: https://www.statista.com/statistics/607716/worldwide-artificial-intelligence-market-revenues/

[4] Artificial intelligence does not exist, Luc Julia, 2019. First editions

[5] Upperground of Mouawad Laurier. Installation at the Lumière Festival 2018, London.
https://www.lumiere-festival.com/programme-item/upperground/

[6] Stop motion is the technique used to film in real time and then show a film that has been speeded up dramatically.

[7] Circumplex model of affect: Journal of Personality and Social Psychology, James A. Russell, 1980.

[8] Automatic Classification of Musical Mood by Content Based Analysis, Cyril Laurier, 2011.
PhD dissertation. Music Technology Group. Pompeu Fabra University, Barcelona.