

A
Bonne Pioche Cinéma & Paprika Films
Production

THE MARCH OF THE PENGUINS 2

Written and directed by **Luc Jacquet**
Narrated by **Lambert Wilson**

Original Music by **Cyrille Aufort**

82M

“Twelve years after MARCH OF THE PENGUINS, I am once again reunited with the emperors for the « Wild-Touch Antarctica » expedition. After talking about them throughout the world, they had almost become something abstract. I was worried that the image I had of them surpassed reality. But no! It was an absolute pleasure to see them again. They are even more beautiful than I remembered! The attraction that I have for them remains intact. Firstly, there is their silhouette which reminds us of our own, from far away it's quite disconcerting! To spend time with the emperors isn't just a question of observing them, it's an encounter. They are familiar with us. That is something very rare. We are predators, animals run away from us. Penguins tolerate us, they are curious, they approach us... They are truly unique animals. My fondest memory is walking along the ice field, a penguin meeting me and sharing a part of the walk together. It is an immense privilege to live this moment with you... and to continue the adventure...”

“This secret Call, this instinct which allows the emperor the feat of being surviving where no other creature lives, was a revelation to me during my last trip. I hadn't seen it in this light when I was writing MARCH OF THE PENGUINS, mesmerised by the visible surface of the natural story of this family which struggles for a season to raise its young one. This time, I observed the emperors with a calmer, more receptive gaze, and was overwhelmed by the magnetic force of the Call.”

Luc Jacquet

THE STORY

After 2 months of shooting in unique conditions in Antarctica last winter, Luc Jacquet returns with a new film shot mostly in 4K, with unseen submarine and drone shots. This new story sees a young penguin about to embark on his first journey, following the mysterious call that compels every penguin, when winter falls, to set out for an unknown destination. Through the eyes and memories of his 45-year-old elder, we will contemplate this decisive moment, this magnetic call: we will follow our penguin closely during his enthralling journey, focusing on his doubts, his fears, and the challenges that face him at every step... "March of the Penguins 2 - The Call" tells the destiny of one penguin whose powerful and mysterious instinct enables him to survive...

STATEMENT OF INTENT:

November 3rd, Cape Geology Archipelago, on the coast of Adélie Land

The winter blizzards have finally fallen silent. In the colony, they're taking it easy: the adults sleep, lying in the snow; the chicks, now as large as their parents, scratch obsessively at their down, revealing their brand new plumage, pristine spots beneath the grey plush. One of the emperor penguins looks with unusual intensity at his big clumsy chick that still begs for a little food. A strange look... in which I see everything one can feel for a healthy offspring when one has paid for his survival with every cell of one's being. And the male knows the cost of this struggle to live, the price of the sacrifice required to give life in the midst of the world's harshest winter. Forty times he has travelled from the sea and must remember every journey. Forty winters spent fighting the unimaginable, forty years during which, without fail, he has answered the Call.

As he looks at his chick, this venerable creature knows deep down that this journey will be one of his last. The Call is fading within him and yet... he was the same age as his chick when he heard it for the first time. This Call prompted him to leave the colony and his fellows one day to walk to a specific location that he had never seen. Once again it was the Call that urged him to dive into the frozen water on reaching the ocean despite a thousand hesitations and a hundred thousand fears. The Call that guided him without his ever being taught the art of swimming and hunting down unfamiliar prey in the depths. And the same Call heard again five years later, that ordered him to leave the ocean for the spot where he had been born to obey the life instinct. His whole life has been followed a specific plan, precise and mysterious.

This secret Call, this instinct, this perfect programme that allows the emperor penguin to carry out the miracle of being alive where nothing else lives is concealed from us humans. It came to me as a revelation during my last trip. I had not remarked it when I was writing "The March of the Penguins", obsessed as I was with the visible aspect of the natural history of this family fighting over the course of a season to raise its offspring.

This time, I approached the emperors in a more tranquil and open-minded manner, and I was overwhelmed by the magnetism of the Call.

I first noticed it with the chicks that I was living with on a daily basis. One by one, I saw them take the decision to leave the colony, first individually and then, as the days went by, in increasingly large number. It was time to leave, but who had told them? Over the course of six Antarctic expeditions, I had never had the opportunity to observe this behaviour. This year, the emperors were early, the thaw had opened up the sea a few kilometres from the colony: unique and favourable circumstances to observe this spectacle that usually takes place far offshore on an ice floe freed by the melt, and so inaccessible.

I then followed them on their march towards the ocean, surprised to see them copy the behaviour of the adults' procession without anyone ever having taught it to them either. I have seen them wandering on the ice, awkwardly crossing crevasses, stumbling into ditches, so comical yet so determined. Who gave them their direction? After kilometres of walking on the vast expanse of ice, I have seen them stop on seeing the ocean and stretch their necks, visibly surprised by the sight of this water that they had never seen before. They needed several long hours to cover the last few hundred metres of their journey, often stopping to look at the water, visibly surprised and already fearful. How could I have missed the individual dimension, the prodigious nature of this amazing story?

With them, I spent days at the water's edge, following their prevarications, their hesitations, days when I thought a hundred times that they would leave. But no, it was not yet time. And then, all of a sudden, one jumped into the sea, awkwardly, panicking, beating the cold water with his flippers before climbing back out somehow onto the ice, clinging on with beak and feet. Further procrastination, then a few hours later the group left, the Call was stronger... and I witnessed that emotional moment when the young emperors surrender to the ocean.

I saw them go to sea, some clumsy and awkward, others already remarkably at home in the water. Our underwater cameras have shown us that some knew instantly, instinctively how to

swim and dive, while others didn't. A complete metamorphosis, a change of lifestyle and universe in less than a second. And I have seen them go to sea, increasingly at ease, in a din of splashing and flapping flippers. The sea was sublime, deep blue dotted with huge icebergs. I followed them in my mind... How would they manage, after fasting for weeks, to find food and acquire the skills needed to fish in the depths before dying of hunger? A tough apprenticeship!

On returning to the colony, I saw unperturbed adults still feeding the chicks that had hatched late. Alongside my biologist friend, I saw individuals tagged on this spot by scientists more than 45 years ago. The individual dimension of the emperor's fate suddenly struck me.

This was during a "warm spell" when the pack ice turned into an impassable lacy network, forming loose traps half a metre thick that gave way beneath our feet. The emperors had trouble with this trap. I thought back to the blizzards of winter, I thought about the single individual I had followed in the maelstrom of the pack ice on previous days, infallibly following his path through the storm. Does this animal never know peace away from its life in the ocean? We had just filmed them at great depths thanks to a team of specialist divers, gliding over the highly fertile gardens of the deep, a hundred meters below the surface, that no one had ever seen or filmed.

And I saw this individual as old as I am, standing peacefully just a few metres from my camera and I tried to imagine what his life had been like. What were his memories? Did he recall memorable winters, icebergs both sublime and ephemeral that had marked his route during one winter before being replaced by others the following season, according to the whims of the ice-jam and the drifting of the ocean currents? Following the thread of my story, I realized that, from one year to the next, he had never marched in the same landscape. And yet, each time, he found his path, alone or in a long column, beneath the sun or wading through thick snow. The Call! At his side, my mind pondered the mysteries concealed from me by the secrets of his existence. The mystery of his migration routes, underwater and on land, his intuitive knowledge of when exactly things must be done, renouncing aggression, survival of the couple, infinite patience...

And again I saw the chicks jumping into the water... In the middle of nowhere, on the ice stretching as far as the eye can see, the emperor instinctively knows the notes of a universal symphony that connects me to him: the art of being alive. "The Call" is his secret, the key to this perfect, precise and successful life. I want to film the story of this emperor's destiny, as I envisaged it at his side last November, in Adélie Land, on the outer edges of the South Pole.

AT THE HEART OF THE ANTARCTIC WITH LUC JACQUET – the genesis of the project

The Antarctic, the end of the world, a continent of extremes that exudes a captivating beauty... My passion was born in 1991 during a scientific expedition over the course of winter for which I would stay fourteen months at the Dumont d'Urville station as part of an ecological programme of the CNRS [The National Centre for Scientific Research]. Before my departure, I met the Swiss director **Hans Ulrich Schlumpf** who encouraged me to make the most of this unique situation to capture images. I spent many deeply pleasurable months filming the emperors. According to him, I had a good eye and I had to keep going. I decided to change career: I had found a way to travel and an excuse to return to the Antarctic, which I was dying to do.

I then filmed TV documentaries while keeping in mind that there was a fabulous story to tell about the emperor penguin. After searching for a producer for years, Bonne Pioche and a distributor (Disney France) came on board. MARCH OF THE PENGUINS was shot over thirteen months, the time needed to film the penguins' breeding cycle in its entirety. When the film was released, I was swept away: close to 2 million tickets sold in France, a César and an Oscar®... A phenomenal success. I grasped what was happening to me with both candour and enthusiasm. A life turned upside down.

The call of the Antarctic

The Antarctic obsesses and transports me. Every time I go back there, it's a dream, a marvel and an adventure. The magic remains intact. All in all, I spent three and a half years there and I will never grow tired of it.

Deep down, I had the feeling that I hadn't said everything I had to say about the emperors, that there was an aspect of their life I had yet to grasp. So much so that I moved heaven and earth to organise this new expedition to Dumont d'Urville to the Géologie Archipelago, one of the most beautiful places on earth.

To reach the Archipelago requires a twenty-four hour flight from Paris to Hobart, in Tasmania, followed by an eleven-day journey by boat, navigating alongside icebergs and battling storms. Eleven of us arrived, eleven different outlooks taking part in the artistic and scientific expedition « **Wild-Touch Antarctica** » to bear witness to the beauty and incredible biodiversity of this location, and share a fresh outlook on the Archipelago. **Jérôme Bouvier**, the cameraman and an old friend; **Eric Munch** the sound engineer; oceanographer and photographer **Laurent Ballesta**; the divers **Yanick Gentil** and **Thibault Rauby** who brought back up the splendid underwater images of the emperors; **Cédric Gentil**, assistant director and a diver himself; **Emmanuel Blanche** the doctor who ensured the divers' safety; **Manuel**

Lefèvre who was there to film us every day and thus to share our adventure; **Guillaume Chamerat** the only assistant camera of the expedition who was responsible for taking care of the equipment and footage, and **Vincent Munier** the famous wildlife photographer, who came to immortalise this incredible place.

As soon as I arrived, I dropped my bag and went to the penguin colony. I hadn't seen the emperors in twelve years. Here I found them at last, as if they hadn't moved, as if time had stood still since my last trip. What a feeling to be face to face with these 7000 emperors! We were there for two months, from November to December during the austral spring, initially to film footage for a multimedia project. I was going to be able to take the time to observe them once again, to follow them at all times so as to study their behaviours with an extraordinary freedom to film them. I was now mature enough to appreciate the absolute privilege I had of being there.

The trigger

It is during this expedition, as I witnessed the departure of the chicks towards the sea, that I had the idea of making a film. Why did they set off so suddenly? Had they heard a signal? Sedentary, they had been living four months within the colony and suddenly, they decided to take off. I decided to follow them. Not once did I take my eyes off them. I progressed at their pace, sometimes I ran ahead. Their course took hours; they would stop, hesitate, and search. I went with them right up to the water. For the first time, I was going to witness the great dive of the emperor chicks. For hours, nothing happened. At nightfall, **Vincent Munier**, one of the two expedition photographers who was handling twilights, took over. The next morning, still nothing. They hadn't moved. What were they waiting for? They would stay there, unwavering. After four days and much delay, one of them came close to the edge, at the foot of the camera and dived. The others followed. They all jumped in together and disappeared into the distance. It moved me hugely. I had spent days at their side and I knew that I would never see them again.

These adolescent chicks, still covered in their down, had thrown themselves into the water for the next four years, without knowing how to swim. Is this what we call instinct?

Studying the emperor's life cycle, I realised that it was scattered with encounters they never shied away from. During the course of their evolution, the emperors had created a form of excellence that allows them to survive where no other living creature can. All of a sudden this seemed so obvious: it was a silent score, of which we only glimpse the major chords, that I hadn't been able to grasp until this moment. This force which guides this species, **this instinct.**

At Dumont d'Urville, the emperors have been tagged since 1956. **Christophe Barbaud**, a biologist friend who was there, told me he had monitored a 43-year-old emperor penguin. This elder's destiny, in his last reproductive season, fascinated me. Holding on for over forty years... How many times had he dodged death attempting to find the ocean after four months of fasting in the worst winter on earth? How many predators had he managed to escape from? I had my story. His longevity gave me an interesting dramatic element that shared themes dear to my heart, such as the feat of being alive, tenacity and transmission. I approached the penguin like I would an actor. I wanted him to tell me about his journeys. As humans, we feel extremely fragile when faced with the insanity of the Antarctic elements. The emperor however, remains stoic amidst the blizzards. This demands respect and admiration. Everything about this wild animal fascinates me: its charisma, tranquillity, allure, codes which are so close to our own.

Deep-sea diving in Antarctica, a world premiere

More than a decade after filming MARCH OF THE PENGUINS, the equipment has of course, greatly improved. I wanted to make the most of it and create images that really do justice to the stirring beauty of the Antarctic. Technological advances allowed us to create incredible imagery, to test the 360° camera and to capture a more immersive sound. But the real achievement comes from the team of divers led by **Laurent Ballesta** (a marine biologist and world renowned specialist in underwater photography). The team achieved a world first by doing a series of deep-sea dives, over 70m below sea level, into the Antarctic Ocean at -1.8°. Their technical knowledge and human sensibility revealed a side of the emperor entirely unknown to the general public: it's underwater life. Thanks to the images captured during these dives, we can observe the emperor underwater, in his element. Graceful, he is a swimming virtuoso perfectly adapted to aquatic life.

No one before them had dived so deep and for such a long time in the Southern Ocean. It was exhausting. For three hours in water, you needed six hours of preparation, followed by six hours of recovery after the dive. To fight the cold, the divers were equipped with four layers of clothing, one on top of the other, topped with balaclavas, gloves, breathing equipment and gear for filming. In total, 90kg of kit on their backs. The slightest movement was complicated. These toughened divers suddenly felt like novices once again.

Few are capable of accomplishing these committed and hazardous dives. You need a will of steel, a lot of experience, an excellent knowledge of the gear and to be in perfect shape. Once underwater, the slightest mistake can be fatal. I think they really frightened themselves at times. The divers must respect very lengthy stages of decompression so as to eliminate

the great quantities of neutral gas they have accumulated. If these stages are not respected, the divers risk potentially lethal desaturation accidents. It is therefore impossible to come up fast, even if you are tired and frozen. Most of these dives were dives under a ceiling, that is to say, under a thick sheet of ice. Once underwater, it's completely dark, the divers moved forward by the light of their lamps. Their greatest fear was being unable to regain the surface, trapped by the lid of ice. To find again the hole they used to climb into the water, they unrolled an Ariadne's thread, a lifeline from which they never ventured far.

In total, the divers visited twenty different sites and undertook thirty diving expeditions, a real performance. And each time they would resurface with images that were always more surprising than the last. The contrast between this aquatic world and the one on the ice floes is striking. Underwater, there is a biodiversity, very rich and colourful, an unknown world until now, revealing itself a little more each day thanks to their images.

Posterity

Today, this universe is threatened. The currents are changing, modifying the movement of the ice, helping some species, punishing others. For the first time in centuries, it is raining in the Antarctic, endangering the emperor chicks whose down is not resistant to water during their first months of life. It is so cold here, that if made wet, the chicks die frozen. And recently, vegetation has started to appear, upsetting the ecosystem. So yes, if the film can help open eyes and encourage missions I will be the happiest of men.

The Emperor

The emperor penguin is a species balancing on the tightrope of life. This bird measures over a metre on average, and is capable of surviving where no other vertebrate can. Every year, at the start of winter when all the other animals have left, after a brief summer, the emperor returns to the White Continent to give life, a story which has endured thousands of years.

The cycle of life

In the heart of the austral winter, in the freezing cold night, the emperor chick emerges from his shell. It is July. He remains protected, under a fold of skin on his father's stomach, warm in the incubating pocket waiting for the return of his mother who has returned to the ocean to feed herself and gather provisions. If she is long returning, the male, despite the four months he has spent fasting, has kept a last reserve to feed the chick his first meal.

When the female returns a few days after the birth of the chick, the couple is able to find each other thanks to their unique call. The mother and her young finally meet and learn each

other's song. With extreme care, the male hands over the chick to the female and in turn, returns to the ocean. From then on, the parents take over from one another to look after the chick, alternating trips to the ocean and to the colony. This lasts for a month. One parent keeps the fragile chick warm while the other takes fish, krill and calamari from the sea.

At the end of August, when he is a little older a month, the chick is at last 'thermally independent'. The parents can now leave him alone in the colony. To keep warm, the little ones gather together and form nurseries. The chick grows as his parents return on their journey to the ocean.

October arrives and with it, spring. The chick begins to moult. This little grey cuddly toy has a funny look about him all of a sudden! The itching seems awful, as he tries to rip out the tufts of hair that haven't shed yet. Within a few weeks, the entire colony boasts a grey down. The chick, now bigger, is almost ready to set out to sea. Little by little, his parents stop feeding him and leave the colony. Left to fend for himself, he wanders for a little while before reaching the edge of the ice floe. Days go by before he hesitantly takes the big jump. Finally, he throws himself into the water. It only takes a few minutes for this chick, who has only known the ice floes, to become an exceptional swimmer and he shoots off into the open sea. He spends the first four years of his life in the water and travels thousands kilometres.

Then one day in April, guided by a force which we cannot grasp, this chick who has now become a young adult, returns to the continent, at the same time as the others: it is now his time to reproduce. Within a few days the emperors meet on the ice floes and begin their journey. For days they walk in a line to reach the settlement, where the colony reunites every year. According to the size of the ice floe, it is sometimes hundreds of kilometres from the ocean. This distance varies during the course of the season; it stretches in winter and diminishes when summer arrives. A mediocre walker (0,5 km/h on average) but very resistant, the penguin sometimes lets himself fall down on his belly to move more quickly and propels himself forward with his feet and wing tips - the famous tobogganing technique.

After days of walking, the young emperor penguin finally arrives and will now experience his first breeding season. The parades begin and the emperors sing, searching for one another. Couples form and seem to dance together. The match must be perfect to ensure the success of the season. Once he has found his partner, the two penguins mate. A few days later, the female lays an egg within the colony, then passes the egg to her partner so that she can return to the ocean to feed. During her absence, the male incubates the egg and protects it from the cold. The colony progresses deeper into the winter. Blocked on the shore, his

precious treasure safe and warm in his pocket, he will now have to brave the worst storm of the year. His tenacity is astonishing. In the heart of the icy winter, our emperor survives the terrible blizzards, resisting the cold and fasting for months to incubate his offspring.

No other animal shares such a destiny. In a few weeks, his first chick will see the light of day. Like his father before him, he will raise him by coming and going to the ocean to feed him. When he feels he is ready, he will leave the ice floes and return to the sea, before returning each winter to re-enact the great cycle of his species.

Underwater life

During this expedition, **Luc Jacquet's** team shed light on a new aspect of this animal: underwater life. On the ice floes, the emperor seems clumsy; underwater however, he bursts forward and spins enveloped in clouds of bubbles. It is here, the heart of the ocean, that appears to be his natural environment. This is where he spends half his time. He fishes and lives here between two breeding seasons. Studying him, we realise that his body, designed to survive on the ice floes, is also perfectly adapted to the ocean. His thick plumage isolates him from the -1.8° icy waters. His wing tips, which on the solid ground seem to impede him, are essential underwater, helping him to propel himself. Even the bubbles that surround him as he spins are here for a reason too - they are the result of a fascinating adaptation to an environment.

The emperor traps the bubbles of air in the layers of his plumage. When he needs to accelerate, he compresses the air before releasing it, which allows him to triple his swimming speed! This is how he manages to shoot out of the water and land on the ice floe! The emperor is capable of free diving for 20 minutes and can descend to almost 600m - the record to this day is 565m! This allows him to feed where no other birds can. He subsists principally on arctic krill but also on fish - the small, fatty myctophidae that live in the cold waters. He also feeds on cephalopods and crustaceans. ~~and sometimes also hunts calamari.~~ The variety of his diet depends on the season. His underwater behaviour remains mysterious: does he hunt in a group? How does he find his way? These questions remain to be answered.

INSTINCT

Animal instinct... This mysterious and fascinating notion, this capacity to feel things, to anticipate danger, to know which path to take. Instinct is innate and immutable. It is an unexplained part of animal and human behaviours, those that are passed on genetically and express themselves without being learned and which characterises a species. Instinct is

expressed by an impulsive reaction, often instantaneous. Fundamentally, it is linked to the longevity of the species. Extremely present in what are termed “inferior species”, instinct seems to be less dominant in more evolved species. It opposes what has been acquired or invented by the individual. Instinct should not be confused with intuition, which is what we feel immediately when in contact with people or an atmosphere. Intuition stems from feeling, from sensations.

MARCH OF THE PENGUINS told the natural story of the emperors, the one we observe, and that we can study. This new film completes the story by focusing on what we don't know, the unknown facet of the emperors. What signal calls them all to leave the ocean in March? What force guides this synchronisation? Who pushes the male to leave his chick so as to survive? Is this instinct - the call that pushes this species to be there on time in the crucial moments? That guides the chicks to walk in a line, like the adults? That guides the chicks into the water, even though they have never swam before.

From a scientific point of view, this is not an answer. Science seeks answers, it studies hormones, climatic conditions. But for a filmmaker, this unfathomable part of the animal, the part that resists understanding, is totally fascinating. For **Luc Jacquet**, this unexplained magic in the life of the emperors makes the species even more beautiful! Instinct would be a score played by the emperors: an almost inaudible score, where we only hear the major chords.

Through the film, **Luc Jacquet** explores the mysterious subject that is instinct. He carries us into another dimension where we discover the emperors like we have never seen them before.

THE ANTARCTIC: THE WHITE CONTINENT

The Antarctic has awoken the fantasies of many generations of explorers. Undiscovered until the 19th century, la terra incognita remained unexplored for a long time. Since the 1950s, scientists have made headway into this hostile territory and have, little by little, discovered its best-kept secrets.

2,000 km from New Zealand and 975 km from South America, the Antarctic is situated in the extreme South of the terrestrial globe. Larger than Europe, twenty-five times bigger than France, one-and-a-half times as big as Canada, the South Pole is a continent which is as gigantic as it is hostile. It is made up of an **ice floe** that covers the ocean and an ice cap that

has survived since the Antarctic was frozen over 34 million years ago. The layer of ice covering the bedrock is as thick as the Mont Blanc is high and represents 80% of the planet's soft water reserves. This is known as an ice sheet.

With its 14,000,000 km² ice included, the Austral continent ranks fifth within the continents. Its cover of ice and snow varies between 2,100 and over 4,700 m. Considered one of the harshest environments on planet, the Antarctic is where the strongest winds and the lowest temperatures have been recorded. The lowest temperature recorded at the Russian base Vostok, the cold centre for the continent, was -89°C. This record was recently surpassed in the East of the Antarctic with a cold peak recorded by satellite of -93, 2°C! In January (Austral Summer), the average temperatures reach 0°C by the coast, -30°C inland. In July (Austral Winter) they reach -20°C by the coast and -65°C inland. In Antarctica, as in all cold regions, we encounter what we call the "wind effect". This means that a violent wind can multiply by 8 or 10 the effect of the temperature. In this climate, which is drier than the Sahara, winds sometimes blow close to 300km/h and storms can last for days or even weeks - often in the blackest of nights, several months throughout the year.

A continent belonging to no one

The Antarctic is the pioneer location in terms of international collaboration. Signed on the 1st of December 1959 in Washington, the Antarctic Treaty recognises that "it is in the interest of all humanity that Antarctica is reserved solely for peaceful activities and does not become a theatre or the wager of international discords."

Three decades later, the States eager to reinforce the protection of the Antarctic, devise the Madrid Protocol, related to the protection of the environment in the Antarctic. Signed on the 4th October 1991 and enforced in 1998, this protocol was initiated by the former French Prime Minister Michel Rocard. The signature countries commit to ensuring the global protection of the Antarctic environment and its associated and dependant ecosystems. The Antarctic is thus designated as being "a natural reserve dedicated to Peace and Science."

Today, the Antarctic Treaty and The Madrid Protocol remain in effect. They celebrate the Antarctic, land of peace and science, protected from all territorial claims and exploitation of resources. However, new forces install themselves each year on the continent without hiding their interest in the rich resources that the continent can offer.

DID YOU KNOW

The Géologie Archipelago

The images of the film were created in one of the most beautiful places on the planet: the Géologie Archipelago, where more than a century ago, the French took their first steps into Antarctica. It is a region scattered with rocks over a 15km radius. This makes it a true natural reserve for biodiversity, as it is one of the rare places in Antarctica where birds can find raised rocks to nest on. When spring comes, three quarters of the species that reproduce in Antarctica find themselves here for the breeding season and cohabit for four months. This place, which had fallen asleep in the arms of winter, all of a sudden awakens. Snow petrels, Weddell seals, Adélie penguins, South polar skuas... Within a few weeks the area is buzzing with life. More than 100 birds can be counted per square metre! Spring is short-lived in the Antarctic, the animals only have a few months to parade, mate and raise their young before they in turn start their journey. Everything occurs at a fast pace. For few months, there is a flurry of activity. Then in December, with the arrival of the Austral summer, they all return to sea. The agitation dies down. They won't be back until next year.

An inverted reproductive cycle

Birds tend to cue their reproductive cycle when food is plentiful so as to feed their young well. Emperor penguins follow a completely inverted rhythm: they reproduce in the middle of winter, when food is scarce. To raise their young ones, they need a lot of time, almost five months for the chicks to be strong enough to set out to sea at the end of December during the Austral summer. It is at this period that food is the most abundant. The chicks will be able to find their food more easily. It is a reproductive strategy that allows the emperors to maximise the survival of autonomous chicks.

The emperors recognise each other thanks to their song

Each emperor has a unique vocal signature; this allows them to clearly identify each other. In emperor and king penguins, this signature is a little acoustic comma, a slow transition from deep tones to high-pitched ones repeated four to five times, a form shared by the whole species. To be heard over the cacophony of the colony, penguins rise up and use their chests as sound boxes. A silence forms around the singer for just a few seconds - enough time for the one being called to hear the song. So as to hear the songs and locate those they are looking for, the penguins' left and right ears are asymmetrical in relation to their bodies. This allows a penguin to identify a cry drowned out by the songs of the others. An adult distinguishes the cry of his chick even when the sound of the colony surpasses 6 decibels – that is to say twice as loud as the chick itself. In a colony of a million emperors, the reunion

can take up to 85 minutes.

The plumage of the emperors is even colder than the ambient air!

While studying infrared images of the colony of emperors at Dumont d'Urville, Scottish and French scientists realised that the surface of their plumage was colder than the air. Almost all the surface of the plumage of the birds was below freezing point, except for their beaks and their eyes. This allows them to trap heat by convection: when in contact with the cold feathers, the air releases a few particles of heat.

Ice-dams

The ice field is seawater that has frozen on the surface. In Adélie Land, it generally forms in March. This is what we call the ice-dam. For this phenomenon to occur, the temperature of the air must be stay cold for a few days and the temperature of the water must reach 1.8°C in the first 1 metre of depth. At this temperature the salty seawater freezes. In Antarctica, the ice-dam is a signal for the emperors. As it begins to form they move to the edge of the continent to find their settlement and to reproduce.

Their settlements

The emperor's settlements are areas where the penguin colonies meet to breed during the Austral winter. Despite the vast surface area of the Antarctic continent, there are very few settlements. This is because they have very specific criteria. They are platforms of very flat ice, stable all year round. The ice must be solid and thick enough to allow the penguins maximum security throughout their breeding cycle. The orientation of the site is also decisive: the settlements are sheltered from the wind as much as possible; if it is too intense, it weakens the ice field. The emperors also always settle close to food resources, as they have to come and go frequently to feed their chicks. The ocean remains accessible and we often find polynyas a few kilometres from the colonies. These polynyas are large fractures in the ice that allow access to free water. The Dumont d'Urville base is an ideal location - this is why it shelters an important colony of emperor penguins each year.

The lover's parade

The parades begin when the emperors return to their settlement. They last approximately ten days - a huge gathering uniting every emperor of the colony. It is at this time that the number of emperors is at its peak. The males and females ready to reproduce are there and a few curious younger penguins. The latter won't reproduce but will return the following year. The emperors parade all together, simultaneously in a veritable concert of song. For days, the emperors seem to dance, stretching out their necks and tilting their heads as if bowing. It's

surprising to feel so much tenderness in their parades. Some couples - only 15% - manage to recognise each other season after season. For the rest, new couples are formed. The young emperors and the adults that haven't yet found their partners return to the ocean. Life on the continent in the middle of winter is far too tough; the emperors only come here to breed. At the end of the parade, couples mate and then the calm returns.

The Austral Summer

As the earth turns around the sun, the seasons are inverted between the Southern and Northern hemispheres. In the Antarctic, Austral summer starts in December and lasts three months until February. This period is the mildest on the white continent. It is at this moment that the ice floe encircling the continent, finally melts. This frozen sea water breaks up into giant icebergs, freeing the way for ships which can now come alongside the continent. During the Austral summer, sunshine is almost permanent. The closer you get to the South Pole, the longer the hours of sunshine. The 21st December is the summer solstice. On this day, the Southern hemisphere witnesses the longest day of the year. This day is marked by the permanent presence of the sun at the South Pole.