WARNER INDEPENDENT PICTURES
AND
NATIONAL GEOGRAPHIC FEATURE FILMS PRESENT
A BONNE PIOCHE PRODUCTION
IN ASSOCIATION WITH WILD BUNCH

MARCH OF THE PENGUINS

(LA MARCHE DE L'EMPEREUR)

A FILM BY LUC JACQUET

AS TOLD BY
MORGAN FREEMAN

NARRATION WRITTEN BY
JORDAN ROBERTS

BASED UPON THE STORY BY
LUC JACQUET

BASED UPON THE SCREENPLAY BY
LUC JACQUET & MICHEL FESSLER

MUSIC BY
ALEX WURMAN

CINEMATOGRAPHY
LAURENT CHALET JERÔME MAISON

A FILM PRODUCED BY
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WITH THE PARTICIPATION OF
BUENA VISTA INTERNATIONAL FILM PRODUCTION [France] and CANAL +
A CO-PRODUCTION WITH APC IN ASSOCIATION WITH THE FRENCH POLAR INSTITUTE [IPEV]

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Sound: Dolby SR

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AN INCREDIBLE STORY OF COURAGE, ADVENTURE AND SURVIVAL

THE STORY

Each winter, alone in the pitiless ice deserts of Antarctica, deep in the most inhospitable terrain on Earth, a truly remarkable journey takes place as it has done for millennia. Emperor penguins in their thousands abandon the deep blue security of their ocean home and clamber onto the frozen ice to begin their long journey into a region so bleak, so extreme, it supports no other wildlife at this time of year. In single file, the penguins march blinded by blizzards, buffeted by gale force winds. Resolute, indomitable, driven by the overpowering urge to reproduce, to assure the survival of the species.

Guided by instinct, by the otherworldly radiance of the Southern Cross, they head unerringly for their traditional breeding ground where - after a ritual courtship of intricate dances and delicate maneuvering, accompanied by a cacophony of ecstatic song - they will pair off into monogamous couples and mate.

The days grow shorter, the weather ever more bitter. The females remain long enough only to lay a single egg. Once this is accomplished, exhausted by weeks without nourishment, they begin their return journey across the ice-field to the fish-filled seas. The journey is hazardous, and rapacious leopard seals a predatory threat. The male emperors are left behind to guard and hatch the precious eggs, which they cradle at all times on top of their feet. Subjected to subzero temperatures and the terrible trials of the polar winter, they too face great dangers.

After two long months during which the males eat nothing, the eggs begin to hatch. Once they have emerged into their ghostly white new world, the chicks can not survive for long on their fathers' limited food reserves. If their mothers are late returning from the ocean with food, the newly-hatched young will die.

Once the families are reunited, the roles reverse, the mothers remaining with their new young while their mates head, exhausted and starved, for the sea, and food. While the adults fish, the chicks face the ever-present threat of attack by prowling giant petrels. As the weather grows warmer and the ice floes finally begin to crack and melt, the adults will repeat their arduous journey countless times, marching many hundreds of miles over some of the most treacherous territory on Earth, until the chicks are ready to take their first faltering dive into the deep blue waters of the Antarctic.

"March of the Penguins" tells one of the most beautiful love stories on Earth.

DIRECTOR'S STATEMENT

With short steps, bent under the pitiless burden of a driving snowstorm, the emperor penguin labours through a vast labyrinth of ice. Around him, all is white, all is in violent flux. Yet the valiant bird never falters, undaunted by seemingly insurmountable obstacles. He keeps going. In this land where no other creature ventures, the emperor continues on to his romantic rendezvous. As it follows the winter migration of the emperor penguin, "March of the Penguins" tells a tale of legendary proportions, portraying the strange, spectacular destiny of powerful and emotionally-involving characters, rich in courage and humour, mystery and manifest drama.

My goal is to dig from the ice a story which has never seen the light of day for want of a teller. A true story, however extraordinary. A story repeated every winter, as it has been for hundreds of thousands of years. But there has never been a generation of men to witness and shape it, to pass it down, for man has never colonized the Antarctic. The emperor penguin had never encountered man before the first polar explorers arrived barely a century ago. In 1950, when tentative, makeshift bases were established here, scientific observation had replaced legend as Man's preferred narrative.

The emperor penguin and man have not lived together long enough for folktales or myths to develop. They remain strangers, crossing on rare occasions in the vast desert expanses of the Antarctic.

With this in mind, my desire is to tell a real story: through the extraordinary images of the emperor penguin during the austral winter, images that have always fascinated me; and with words worthy of both the Antarctic's excessive nature, and the emperor's epic destiny. It is time for the emperor's legend to be told.

LUC JACQUET

ABOUT THE PRODUCTION

There has never before been a comprehensive feature-length film depicting the extraordinary struggles and triumphs of the emperor penguin. Our task was a mammoth one, requiring a full film crew to set up camp in the Antarctic during the winter and remain for thirteen months with no possibility of sea or air transportation. Thus stranded, our constant presence allowed us to capture the full and remarkable variety of penguin behavior, as well as many bizarre and unique encounters.

Of the 40 or so extant emperor colonies worldwide, only four are studied on anything like a regular basis. Only one is accessible without mounting an independent expedition: the Geological Headland Archipelago colony in Adelie, a few hundred meters from the French scientific center of Dumont d'Urville. The center provided the perfect base for our shoot, and our close relationship with the Institute for Polar Research guaranteed us effective, active cooperation. We are also deeply indebted to the support we received from the French Institute Paul-Emile Victor. Filmed in super 16mm to convey the full visual impact of this magnificent environment, "March of the Penguins" includes underwater footage of the penguins' winter activities, shot by experienced divers using specialized cameras and never previously captured in such breathtakingly beautiful detail.

A CONVERSATION WITH DIRECTOR
LUC JACQUET

How does one become the director of a film like "March of the Penguins"?

Obviously, totally by chance. It all began with a classified ad which basically said something like *"looking for fearless biologist, ready to spend fourteen months at the end of the world"*… Of course, I had studied biology, in particular animal behavior, and I wanted to become a scientist. But I was as attracted to nature and adventure as I was to roughing it in extreme conditions, so this kind of premise was very appealing to me. At the time, the assignment was to film images of emperor penguins… The only problem was that I had never held a camera in my life. So I started with a ten-day training period to learn how to film with a 35mm camera. Then I left for my first stay at the Dumont d'Urville French Antarctic station with two assignments: to band the birds, and to film a very precise list of shots. At the time, I was 24.

Weren't you put off by the fact that you were starting in such extreme conditions?

No, not at all. I was born in Eastern France, in the Jura mountains, and started skiing when I was three years old. So I already had experienced the cold.

In the end, I was not *that* interested in the academic side of research, which required devoting much more effort to interpretation, instead of working in the field, which I preferred. And it was a friend who came back from shooting a documentary on orcas in Crozet Island, in the French Antarctic Territories, who gave me the idea for my first film "Sea Leopard, Lord of the Ice." Everything took off after this, and there were many trips to the Antarctic. Twelve years later, I am still roaming around the 66th parallel.

How did "March of the Penguins" evolve?

I started this project four years ago, and slowly, over months, it began taking shape. The producers (Bonne Pioche) came onto the production in August and we had to work fast to meet our goal of starting production in January. As the story began to evolve, we all agreed with enormous enthusiasm – which was an incredible driving force – that what was originally intended to be a television film needed to become a feature-length theatrical film. With challenges at every level of the production, this became a rare adventure. There was a huge desire to make this work, along with a determination and an energy that, at times, made the whole thing feel like a military operation. But it was all pleasure in the end.

I had this pure and simple, very straightforward story of survival for this cursed species. I knew where and when to film and had completed my filming breakdown. The only thing left to do was to wait and rely on the actors. We knew what was going to happen, where and with whom, but we did not know exactly "how" it was going to unfold. You have to remember that this is Antarctica, and that penguins are animals.

Why do you say "cursed species"?

Because the emperor penguin is a fabulous creature evolving in the open seas, capable of diving as deep as 1,400 feet for as long as 20 minutes. But in order to breed, for some unknown reason, this extraordinary creature pays an enormous price for all his majesty, and finds himself walking like a penitent for miles upon miles in the blizzards of Antarctica, far from the ocean, just to lay one egg. He does this in the most stable environment he can find, and then goes back and forth all winter between the colony where his life is hellish, and the sea where he finds his

sustenance! There are only a few dozen places where he can lay his eggs, no more. So the emperor penguin lives his life on the edge. There is no life beyond him. We are almost in the realm of biotics. There are no living cells in Antarctica, and in this white desert, the emperor is the sentinel, the last living element on the planet – assuming we are still on the same planet. Although Antarctica is not yet space, it is almost no longer earth! We are on the border between reality and fantasy. Emperor penguins, desert nomads… nature creates mirages. All our references are gone, or simply reversed, even the seasons are reversed. If you haven't experienced freezing 100-mile an hour (162 kph) winds, it is hard to imagine what it is like.

I tried to juggle with all these fantastic elements. I created surreal images with reality. And I attempted to take the viewer along like a father or a mother takes his child on a journey with a bedtime story. The penguin is an extraordinarily endearing creature, who despite being an animal occasionally has striking human qualities. And filmically, there are many twists and turns in the story. In some years, up to eighty percent of the chicks die.

Were there unexpected dangers?

Yes. For instance, if you get too close to the colony, then hundreds of eggs can be lost. This is something that gives you a great sense of responsibility. I've never witnessed anyone being attacked. This is probably because it would "cost" the emperor too much energy which he cannot afford to lose, considering everything he has to deal with. The emperor penguin has a very peculiar relationship to man. One day, he'll let you approach, and the next he won't. So you have to be on your best behavior, because if you don't respect him, you won't get any images of him. You always have to manage what's going on. There's a saying which goes something like this: "If you want to dominate nature, you have to obey it." You have to have smarts!

How long did the shoot last?

One year and 120 hours of images. A whole winter-over cycle, the cycle of the emperor. And this without seeing any of the images as we were progressing. Neither the men, nor the footage left the shoot before the story wrapped. It took me a year to recover. Re-entry is a long process.

Is global warming (which ranges from 4° to 10° depending on the region) a menace for the penguins?

It is clear that if the sea ice shrinks, the penguins will not have to walk as far to get to the ocean. By the same token, they'll have less to eat. Many species – seals, whales, penguins, among others – feed on *krill*, and because the winter ice has been melting, and the *krill* feed on algae which grows under the sea ice, there is less *krill*. This is just one proof that climate change has immediate consequences.

BETWEEN REALITY AND FANTASY

The story of the emperor penguin and of its breeding habits is unique. It combines elements of love, drama, courage and adventure – all in the heart of Antarctica, the most isolated and rigorous region on earth.

This script offered to us by nature has been replaying itself for thousands of years, but was only discovered by man at the beginning of the 20th century.

The Story of a Species Ready to Make Every Sacrifice to Give Love

February is the end of summer in Antarctica, the sea ice is melted and the sea has become accessible.

A huge school of penguins is swimming in a deep blue sea towards the radiant light on the surface. Giant icebergs gave off an opalescent light as they sink into the depths of the ocean.

Emperors are at home here, in this smooth, temperate kingdom teaming with calamari and fish.

In **March**, emperors jump out of a grey and vicious water between the ice floes, like torpedoes. They fall back heavily onto the snow-covered ice which covers the sea all the way to a blurry horizon.

Soon, lost in the torment of a white universe, the penguins are gathering in small, scattered and gloomy groups. From the extreme edge of the sea ice, they start marching inland, in file, taking small steps as if in a procession leading them to an imaginary holy place. Thousands of individuals will now have to battle the coldest of temperatures.

The orange spots on their heads appear fluorescent in this slight grim light. The snow flakes land on these colorful spots and do not melt.

Around Antarctica, the ocean is starting to freeze…

An interminable caravan of hundreds of emperor penguins is progressing in step, and in silence. No other living creature can endure the climate of the place towards which they are heading. But the emperors do not have a choice. They need weeks to accomplish their mating rituals, and then months to raise their progeny. And the three short summer months would not suffice. So each year, to breed, this long line of penguins has a date with one of the worst winters on the planet.

In early **April**, after walking for days on end, trekking over dozens of miles, and overcoming numerous perils, the moving procession finally finds its bearings.

In the *Pointe Géologie* archipelago, the penguins are gathered on the *oamok*, and their time has now come to sing, lure and mate.

For Better or for Worse

Seen from the sky, the emperor colony seems huddled up in a small enclave surrounded by an immense white void. The colony is protected to the North by an archipelago of dark islets, to the South by the cliffs of the continent, and to the East by a long glacier tongue spreading out over the Antarctic ice shelf. At the end of this glacier, there are hundreds of almost-calved icebergs forming a long ice jetty. This gigantic barrier, over one hundred feet high, protects the rookery from the dominant Southeasterly winds which constantly sweep the area. Beyond, everything is desperately flat and white as far as the eye can see.

In the morning, the ice is frozen. It will cover the sea for over 100 miles to the North, surrounding the whole Antarctic continent for the duration of the winter.

An individual is walking through the crowd. Once in a while, he stops, folds his neck down and trumpets a loud and violent song. His head comes back up, he growls and is on his way again, until one of his fellow penguins finally answers him.

What ensues then is a succession of dancing duos. The quasi-geometric lines of the penguins' upper bodies fold and unfold, repeatedly. After the singing, they adopt an ecstatic position, oblivious to the crowds surrounding them, and remain immobile for several minutes, as if fascinated by the sight of their new partner.

The saying goes that timeliness is the politeness of kings. In the case of the emperor penguins, it is absolutely vital.

Breeding for them is a race against the clock and each step is timed. If a glitch occurs as the process unfolds, then the year is lost, and mating and breeding will only be able to occur the following winter.

Very soon, there are deafening and formidable duos everywhere in the rookery. The courtship dances enable the formation of extremely strong links formed between the partners.

This is for two reasons: first of all, so they can identify their partners – with such a huge crowd and no territories, it would not be a good idea for the male to lose the female companion he has just chosen to start a family.

Despite the unthinkable brouhaha of the mating songs, each penguin has recorded with great precision the "vocal signature" of his or her partner, and will be able to recognize this signature among thousands. By singing, a penguin gives his or her personal recognition "code," as well as his or her sexual desire to reproduce. Also, a singing bird prevents his immediate neighbors from singing at the same time. This protocol provides that each penguin take turns singing and thus avoid a total cacophony in the immediate vicinity.

After the mating dance, and the actual coupling, several small groups take off marching towards the horizon.

These are made up of females who have not found partners this season and are heading back towards the ocean before the dead of winter.

The Most Extraordinary Combat

April and **May** will not be a honeymoon.

The nights last close to fourteen hours, and the young couple survives only with love and fresh snow, without any food, slowly eating up the reserves of fat accumulated since December.

At the end of **May**, the female has lost almost a third of her weight when she lays her only egg. She is standing to lay this egg, and it is a critical time. Under no circumstance can the egg roll onto the ice, because in just a few seconds, it would freeze. So the female immediately slides the egg onto her feet and makes it disappear in her incubating pocket, under her belly.

The male who has lost less weight than his partner, will soon take over the fruit of their union. He will then commit to an extraordinary feat of courage and endurance: to sit on the egg for more than 60 days almost without moving, without eating, and exposed to the worst weather conditions on earth.

His only consolation is that all the males of the colony will be doing the same thing.

But before this can happen, just one day after laying the egg, the couple will face its first challenge, a very delicate and coordinated effort: transferring the egg from the feet of the female to the feet of the male. Neither of them can fail because the egg is fragile, the terrain uneven, and the exercise can be fatal in case of a mistake. After many songs and dances, the female moves back, pushes the egg out onto the ice, while the male takes his beak to push the egg immediately onto his own feet. Again, there is the danger the egg will freeze. There are dozens of lost eggs on the edge of the colony, which are a testament to how difficult this transfer actually is, and to the fact that it requires total harmony between the parents.

With this challenge behind her, the female is now free to set out for the sea. She is considerably weaker than forty days prior when she started this journey, and must now reach the ocean to feed again.

Before leaving, to ensure that she, her partner, and their chick recognize each other's vocal signature when she returns two months hence, they sing one final song before they separate.

Once again, this will be a long, difficult and dangerous walk.

Blizzard? Did You Say Blizzard?

For the males, this is a hellish period. They have not eaten in two months, and they have two more months to wait until their next meal. In the meantime, they'll have to walk on their heels, with their egg on their feet, and will have to huddle up together in order to fight the cold. The demons of winter are upon the rookery. There are no more than two hours of weak sun per day, and the cold is unfathomable -71°F (-57°C), with wild winds, despite the protection of the glacier.

In Antarctica, there are ***catabatic winds***. These winds are masses of air that literally roll throughout the continent, gathering strength over thousands of miles. When they reach the coast, they are at their most forceful. The winds hit the ice, they soar, and in less then fifteen minutes, they can reach speeds of 100 to 150 miles per hour (161-241 kmph). The snow starts to fly all over, and the result is a "*white-out,"* where you loose all sense of depth, all references. The colony becomes a shapeless mass, invisible from 15 feet away.

In order to resist the blizzard, the emperor penguins regroup in a turtle formation. They bunch up together, head to head. These big penguins are compressed against each other, and the formation undulates slowly: to avoid having the same individuals fighting against the wind all the time, the formation swirls around like a snail. Imperceptibly, the ones at the center find themselves on the edges, and vice versa. All this is done very gently, because in addition to the dealing with the violence of the winds and the uneven ice, they need to keep their balance, holding their egg on their feet, while walking on their heels.

Journey to the End of Hell

In the meantime, the females are walking on the ice in the night, searching for the sea. Their trek is not easy. The sea ice does not have a smooth surface. They have to walk over ***hummocks***, pressure ridges of ice between two frozen floes. They fight their way through the ***sastrugis***, waves formed by the wind, which make their procession look like a boat riding the waves. But the worst are the "leads" or "fractures" that run through the sea ice. These fractures separate two large floes, and are covered with very thin ice called "grease" ice that is very young. Grease ice can sometimes be completely melted in the center where a thin rivulet may run. Before crossing each fracture, the females hesitate and then one finally throws herself on her belly and slides through the danger zone, followed by a second and then a third.

Too exhausted, some of the females will not survive the storms, and the many traps of the ice. Once they have covered this stretch, when they arrive to the edge of the water, they then have to avoid being attacked by ***leopard seals*** who are also looking to feed.

Once they reach the ***polynya*** – an area of open water in the sea ice, the female emperor penguins will need just a few weeks to gather new strength and stock up on enough food to nourish their chicks. In the polynya, the emperors become once again the extraordinary swimmers that can dive as deep as 1,500 feet.

The female emperors will remain at the edge of the ocean until they have built up enough fat and filled their stomachs with food. Then, they will need to return in haste to the colony to find their chick and feed him.

At the End of their Rope

At the ***rookery***, the males are still fasting, with their egg resting on their feet. Winter is at its coldest. The single males are resisting with great courage to the incredibly tough weather conditions, with blizzards and winds which can bring the temperature down to -150°F (-101°C) with the windchill factor.

By **mid-July**, the stoic male emperor penguin has been fasting for close to 120 days. He has been holding the constant incubation temperature for the egg entrusted to him by his companion at 95°F (35°C) for 64 days.

Finally, the egg is hatching. In addition to needing protection from the cold and the wind, the small emperor chick is hungry. And the secretions that his father is able to regurgitate will not be enough. He will only survive a handful of days like this, and all this effort may be in vain unless his mother shows up. If she is late, the father will abandon the chick and leave the colony before he reaches a critical stage of starvation beyond which he would not have the strength to get back to the sea in time to feed.

When the female finally arrives and finds her mate among the thousands of others thanks to the vocal signature agreed upon at her departure, the first thing she will do is to regurgitate for her chick some of the precious food she has stocked up during her journey.

After the chick has eaten, he will have to be transferred once again from one parent to the other, with as much care as the egg: just like the egg, if the chick is exposed to the cold for too long, he will freeze and die.

Family Resemblance

Finally free from any obligation, the male emperor penguin can worry about himself and embark on his journey to get back into shape: he has lost between 25 and 35 pounds. But before he leaves, he has one last task: to teach his own song to his child. His chick must memorize this pitch because when the father returns, the chick will be alone, left at the nursery among hundreds of chicks who look just like him. He and his father will have to recognize each other, because chicks can only be fed by their own parents, who take turns one after the other, so this lesson has to be effective.

The male's journey towards the sea will seem endless. The males will encouter the same dangers that the females confronted. If the bad weather persists, the journey will last even longer and many will die. This is a journey that many males do not survive, which explains the discrepancy in numbers between the male and the female population of emperor penguins.

When he returns at the end of **August** (the male will only be gone for about 20 days), it will be the mother's turn again to leave in order to collect food for her chick, who is now at the nursery – a sort of miniature turtle formation where small penguins keep each other warm.

Until their young ones are autonomous enough to feed themselves, males and females will take turns walking to the sea and back, and feeding their chicks.

By **mid-December**, it is ***ablation*** season, and the sea ice melts back to water.

At the rookery, the chicks are starting to venture farther and farther afield. They only return to their parents to ask for food.

A ***giant petrel*** takes up residence near the penguins for a few weeks, to levy his share of isolated chicks every day. To add insult to injury, this bird of prey is only attacking live chicks, because the dozens of small corpses of chicks that are scattered on the ice are too deeply frozen for the predator to be able to eat them.

In less than three weeks, baby emperor penguins will be bigger (20 to 25 pounds) and able to dive and fish on their own. But it will be another four years before they are able to take the road of the rookery to breed.

February. Now it is summer and the start of peaceful days… In **March**, the whole cycle will begin all over again…

Conversation with the Crew:
JÉRÔME MAISON AND LAURENT CHALET

The Human Adventure

The two men who did the camera work on "March of the Penguins," were at the core of the human adventure and talk of their experience.

JÉRÔME MAISON, a sailor with a good deal of marine biology experience, who specialized in the high seas (Southern seas and Antarctica), and **LAURENT CHALET**, director of photography with years of both documentary and narrative feature experience, got on famously from the start. And this was a good thing, because in order for the two of them to remain isolated from the rest of the world for a whole year, it was essential to have more than just the will to keep their commitment.

JÉRÔME MAISON

Interestingly, Luc Jacquet offered this project to me precisely at the time when I had decided to stop traveling as much. At that point, we were just talking about a nature documentary. Then the idea of a narrative feature came up. And suddenly, we weren't talking just about birds, but about characters expressing themselves.

LAURENT CHALET

November 2002 came along and everything started going at top speed. After that, the penguins's timeline became the most important thing, and we found ourselves with less than two months of preparation before leaving.

JÉRÔME MAISON

And of course, one year non-stop in Antarctica ahead of us…

LAURENT CHALET

Everything went so fast that mental preparation took a back seat to all the logistical preparations for the shoot. It was probably just as well: the less time and distance we had, the less questions we asked ourselves. It became not so much about making choices but about preparing a technical and logistical operation that had to withstand 12 months of isolation and extreme cold. This meant, in addition to taking everything in duplicate, that we had to choose a 'film' camera that was as mechanical as possible, strong enough to operate in -40°F (–40°C) temperatures and that we could fix easily in case of problem. I went down to Grenoble to work with the French camera manufacturer Aaton to customize one of their cameras.

After that we had a medical check-up at the IPEV (Institut Français Polaire Paul Émile Victor), the French Polar Research Center which manages all the French expeditions to the Antarctic continent, and then we were gone.

Once on the ground, we agreed on a method, a daily routine, which was based on solidarity and enthusiasm. Instead of taking turns, we worked together as a team. We would get up at 5:30 AM, prepare the equipment for an hour and a half, load four magazines of film (it was out of the question to do this on the ice), get dressed, and take off for a day of shooting, carrying about 130 pounds of equipment each.

Only two things prevented us from filming: the weather, and running out of our daily film stock when we were out on the ice.

JÉRÔME MAISON

Physically – and this is going to sound strange – we were impressed with our own endurance. We were even surprised how good we felt when is was -4°F (–20°C)! Up until the day Antarctica reminded us of its existence, and then we discovered burns and frostbite.

LAURENT CHALET

In fact, the real challenges were elsewhere. This was not about filming strictly biological events, we had to get the full story. As the days and the weeks passed, we had to remember everything we had filmed before, and how we had shot it: which way the characters entered and exited the frame, etc… And all this without ever watching what we had filmed so far because everything we were filming would only be processed upon our return to France! So we had to rely heavily on Luc's shot list. In the end, the only major difficulty we had was whether or not the 'actors' would cooperate during our filming.

JÉRÔME MAISON

The capacity to adapt and to anticipate is absolutely essential. You adapt by accepting a modification that is 'dictated' by the main characters, or by bad weather. When you're filming in 100-mile per hour winds, you need to find solutions in order to keep the camera stable… But in the end, after spending six hours in -4°F (–20°C) temperatures, you need a rest more than the equipment does… In fact out of more than 200 reels we worked with, we had a problem only with one reel.

The transfer of the eggs from the female to the male (with 7,000 penguins on the set) was one of the most difficult scenes to film, because of how discreetly the transaction occurs.

LAURENT CHALET

We also needed to be as pertinent as possible. In order to approach the chicks to film them, for instance, we built a sort of scooter which could roll on the ice, on which we rigged the camera. Our main concern, always, was to create the least possible disturbance. Even at the cost of losing calories crawling on the ice!

JÉRÔME MAISON

The marine scenes also, which were filmed by Patrick Marchand, were particularly difficult. But the result is so stunning! To be able to see this graceful animal in his own element – water – after watching him 'endure' his condition out of the water.

LAURENT CHALET

You have to know the animals you are filming, to be able to anticipate their reactions; you need a lot of patience to see how things develop; and you need a little bit of luck… This is what allowed us to get the images of the penguins walking in file. Thanks to the ornithology lab of the Dumont d'Urville station, we knew where the penguins were going to gather, but we did not know when. And not having that information meant we had to be at the ready every day, because this is an event that occurs only once a year. And the bit of luck we had there, was that there were more than 1,200 penguins, which is very rare. Usually there are several hundred, 500 at the most.

THE EMPEROR PENGUIN

A PARAGON OF THE ANIMAL WORLD

A Model of Energy Conservation

The penguin is an animal that has the capacity to thermo-regulate its own body temperature. It is warm-blooded and can maintain a constant body temperature even in the most extreme conditions. It does this thanks to the oil it secretes to water-proof its feathers (it is able to spread out this oil with its beak and lock in great quantities of air between the oil and the body, which serves as an insulator), thanks to a layer of body fat (which allows it to retain body heat), and also thanks to a high fat content in its food.

The penguin is also able to regulate its body heat by having two different internal temperature levels: its core temperature at the center of its body is warm, while the extremities of its body are nearly as cold as the outside air.

The temperature at the extremities is regulated by a system of exchange of heat between the arteries and the veins. The blood coming from the heart heats up the cold blood coming from the feet, which in turns cools down the blood flowing towards the extremities. In addition, the blood flow in the limbs can be reduced when it is cold.

Other anatomical, physiological and behavioral characteristics have developed as the penguin has evolved, to ensure this thermo-regulation.

Penguins have to deal with both the constraints of sea life and of life on the ice. While marine environments are stable, terrestrial environments are subject to seasonal climate changes. So it is not surprising that the penguin's life revolves around a constant struggle to adjust to cooling or warming.

To better fight against the cold of the Austral winter, the emperor penguins have adopted social behavior patterns which allow them to save a lot of energy. The most striking adaptation is the huddle formation in which the individuals huddle against each other and form a very dense group. Only their backs are exposed to the wind, and they take turns so that the ones at the edge of the huddle formation gradually move towards the center where they will be more protected for a while, until they find themselves out on the edge again.

A Model of Sobriety and Endurance

One of the most surprising characteristics of the emperor penguin, which is its aptitude to survive on its food reserves when fasting.

During this period of fasting, which lasts about 115 days for the male, covers the whole span of the breeding cycle – the courtship dances, the coupling, the laying of the egg, the incubation period, and the hatching of the chicks – each bird can lose up to a third of its body weight.

An Extraordinary Breeding Mode

The coupling produces a single egg which is incubated outside a nest, during the coldest period of the year – the Austral winter – imposing weeks of fasting and effort on the parents. This egg is fragile and cannot come into contact with the ice. It has to be kept in the incubating pocket or else it might freeze, break or be exposed to predators on the look-out.

On average, only about two-thirds of the eggs will hatch. But the number of lost eggs varies enormously, from one year to the next.

A Model of Unique Coding

Another surprising characteristic of the emperor penguin, is its capacity for vocal identification and recognition. Not only can a chick recognize its parent from just $2/10^{th}$ of a second of song, but it is able to do so when six other parents are singing around it at up to 6dB louder than its own parent.

(As noted by Pierre Jouventin, Centre d'éducation fonctionnelle et évolutive (CNRS) of Montpellier)

A Model of Faithfulness

The couples remain faithful for the whole breeding season. They do not, however, mate for life. Only a handful of pairs will reunite from one year to the next.

A Model of Tolerance

The notion of territory is virtually unheard of among the emperor penguins during the breeding season. This is not the case with the Adélie or King Penguins.

The huddle formation, which requires that the penguins pack tightly together in a group, would be impossible if they were defending a nest or a territory against other birds.

THE EMPEROR PENGUIN

SELECTIVE BIOGRAPHY

ADDRESS

Today, they are spread around the edges of the Antarctic continent, in particular in ***Terre Adélie***. The ancestors of modern-day penguins lived in the southern seas long before the sea ice was formed, more than 50 million years ago.

TYPE and FAMILY

Branch: ***Vertebrate***
Type: ***Bird***
Order: ***Sphenisiformes***
Family: ***Spheniscidae***
Genus: ***Aptenodytes***
Species: ***Forsteri***

There are many different cousins – 17 species of penguins in the Southern hemisphere. Most live in the sub-Antarctic islands, on the Southern coasts of Australia, New Zealand, Southern Africa, and Southern America. They are spread from Antarctica to the Galapagos.

Population: approximately 400,000 individuals distributed over 44 known colonies, the largest one encompassing some 80,000 individuals in ***Cape Washington.***

Average life span: twenty years.

HEIGHT and WEIGHT

Adults can grow from three to four feet in height. Adult male emperors weighs between 75 and 90 pounds. Female emperors' weight ranges from 60 to 70 pounds. Both lose considerable amounts of weight during the winter, with males losing over a third of their weight.

FEEDING HABITS

The emperor penguin is a predator of the high seas. It eats *krill* (small, shrimp-like crustaceans), fish and squid.

DISTINCTIVE SIGNS and GENERAL BIOLOGY

The emperor penguin, despite being a very poor walker, has enormous endurance, and is a magnificent swimmer. With rigid wings – quasi flattened swimming oars, which it uses as flippers, and a spindle-shaped body that is extremely hydrodynamic, the emperor penguin is a champion diver, with a known record of over 1700 feet!

In addition to these two means of transportation, thanks to webbed feet, the emperor penguin is also able to slide or "toboggan" on the ice at speeds which can reach 4 to 5 miles per hour.

ENEMY PREDATORS

Orca, leopard seals, and on the ground, *giant petrels* and *Antarctic skuas* which attack the chicks.

ANTARCTICA

The coldest, windiest, driest and darkest continent on the planet.

(Ernest Shackleton, explorer)

The words "Antarctic" and "Arctic" come from ***Arktos***, which means ***bear*** in Greek. *Arktos* is the name of the *Big Dipper*, the bear or pan shaped constellation which can easily be seen in the skies of the Northern hemisphere. It has given its name to the *"Arctic,"* the North Pole.

Antarctic is made up *anti (opposed to)* and *arktos (The Big Dipper);* so in effect, Antarctic is the name of the Southern continent in the South Pole.

Made up of ***sea ice*** over the ocean, and of an ***ice cap*** covering almost all of the landmass, the Antarctic continent is about 1,250 miles from New Zealand and 600 miles from South America.

With its 5.5 million square miles, including the sea ice, the southern continent is the fifth largest in the world.

Its ice and snow cover can vary from 1.5 miles deep to as much as three miles.

Antarctica is considered one of the most rigorous environments on earth, with temperatures as low as -128.6°F (–89.2°C) (recorded on July 21, 1983), and the strongest winds on the planet. In January (Austral summer), the average temperature is 32°F (0°C) along the coast, and -22°F (–30°C) inside the continent. In July (Austral winter), temperatures reach -4°F (–20°C) near the coast, and -85°F (–65°C) inland.

In Antarctica, the windchill factor can multiply the effects of the temperature many times over.

THE DUMONT D'URVILLE STATION

66°40'S - 140°01' E

Funny Place for a Meeting

The Antarctic continent belongs to no one and in 1959, it was designated a special conservation area devoted exclusively to peaceful purposes and to scientific research. As a result, the continent has only one industry: science.

Larger than Europe, about 25 times the size of France, one and a half time the size of Canada, with an ice cap as deep as the Alps are high, with more than 80% of the fresh water reserves of the planet, Antarctica is both gigantic and inhospitable.

In this climate that is drier than the Sahara desert, where winds can blow at more than 150 miles per hour, storms can last days or even weeks. And there is total night for several months a year. At the Dumont d'Urville station, on June 21, there are only three hours or daylight.

Terre Adélie (167.000 square miles) is an extraordinary territory on an extraordinary continent, with a population that ranges from 30 people in winter to about 100 in the Austral summer.

The Frenchman Jules Sébastien César Dumont d'Urville, gave his wife's first name – Adèle – to this frozen land on January 20th 1840.

To reach this far away part of the globe, more than 30 hours of plane travel are necessary. From Paris to Hong Kong in China, on to Melbourne in Australia, then to Hobart in Tasmania.

From there, there is another week to be spent on a ship. Five times a year, the French Polar Institute's* ship, the Astrolabe, braves the most dangerous seas on earth, with wild storms and giant icebergs, to reach the Base Scientifique Dumont d'Urville. The only permanent French research station on the Antarctic continent is located on the Ile des Pétrels, part of the *Pointe Géologie* archipelago.

Established since 1956, DDU, as it is called by the locals, welcomes a continuous flow of French scientific research teams.

But the French research is not limited geographically to Dumont d'Urville, and the Polar Institute also works on other scientific programs elsewhere on the continent. These programs are usually international in scope, such as the deep ice coring program taking place in *Vostok* (the Russian station) and EPICA (a European consortium).

Another permanent station, *Concordia*, is under construction on *Dome C*, more than 600 miles from the coast. This Franco-Italian station which was launched in 1996, will open in 2005. In the meantime, a summer field camp is set up on the site.

*The Institut Polaire Français Paul-Emile Victor is an agency which allocates means for polar research. It supports national research laboratories attached to institutions whose mission is scientific research: universities, the CNRS (National Center for Scientific Research) the CEA (Atomic Energy Agency), the INRA (National Institute for Agricultural Research), etc.

REMINDER AND WARNING

The global warming that affects our planet, and in particular the polar regions, triggers changes that affect primarily the species inhabiting these regions.

Whether in the North or South polar regions, species suffer from the shrinking of the sea ice and its consequences.

In the more or less short term, polar bears and penguins will have no other choice but to change their way of life if they want to survive these changes.

Penguins: The First Victims of Antarctica

In 2001, in Antarctica's *Ross Sea*, two giant icebergs calved, blocking colonies of *Adélie* penguins in their quest for food, forcing them to a detour of more than 30 miles.

The same year, numerous emperor penguin chicks died drowning, because the sea ice melted too early in the season, not giving them enough time to learn to swim.

However natural these phenomena, if the temperature continues to rise, they will become recurrent…

Scientific research being undertaken at the ***Dumont d'Urville*** French station (on the Eastern coast of the continent) has shown that the Pointe Géologie emperor penguin colony has lost 3,000 couples in 50 years; the highest mortality rates, in the years 1976 and 1980, correspond to the sea ice's biggest recess.

Similarly, at the Western end of the continent, because of the rise in air temperatures (4.5°F to 5.5°F/-15.3°C to -14.7°C in 50 years), part of the Antarctic Peninsula has started to become green with of the appearance of algae and mosses.

GENERAL INFORMATION

The Antarctic Treaty and the Protocol of Madrid

With its precious ecosystems, Antarctica is an essential region for scientific research and especially for environmental purposes.

Ice cores from the polar ice cap dating back hundreds of thousands of years can be studied to reveal the natural climate cycles of the planet, and to provide a basis on which to compare the relevance of recent changes.

Hundreds of unique and vulnerable wild species live on the continent. Its marine environment supports a multitude of mammals such as seals and whales.

In addition to contributing to worldwide bio-diversity, the Antarctic plays a central role in the regulation of the world's ocean and climate systems.

Like the Arctic, the Antarctic is a sensitive indicator of planetary changes. A small temperature rise due to climate change can have major consequences on the melting of the ice, which in turn has an incidence on sea levels around the planet, and this can affect people everywhere worldwide.

After having disturbed the environment in Antarctica in a few localized areas (first with hunting and fishing, and more recently with exploration, science and tourism), human activity elsewhere on the planet is contributing to the climate changes by creating a hole in the ozone layer above the Antarctic continent.

Not only is this out-of-control activity exposing the different species of the continent to dangerous radiation, but it is also leaving traces of chemical pollution on the ice cap and on the flora and fauna of the region.

During the first half of the 20th century, several countries claimed various parts of Antarctica. In order to avoid possible conflict stemming from these claims and also to facilitate international scientific cooperation, the ***Antarctic Treaty*** (signed in 1959 and enforced in 1961) recognized "*that it is in the interest of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord*."

The main characteristics of the Treaty are to prohibit any measure of a military nature, to ensure freedom of scientific investigation and international cooperation, and in exchange for information, for the countries involved to renounce previously asserted claims to territorial sovereignty, and to prohibit nuclear explosions and the disposal of radioactive waste on the Antarctic continent.

The main international accords pertaining to Antarctica are: the ***Convention for the Conservation of Antarctic Seals*** (CCAS, 1972); the ***Convention for the Conservation of Antarctic Marine Living Resources*** (CCAMLR, 1980); and the ***Protocol of Madrid*** (1991), which was ratified by 44 countries and enforced in 1998, and according to which, in addition to global environmental protection, the Parties agree to monitor the activities of scientific or logistical expeditions organized on their own territory or leaving from this territory, and to also monitor the activities of their own facilities, airplanes and helicopters and stations in Antarctica. In addition to the fact that certain activities – such as the destruction of historic sites or the harmful interference with flora and fauna, are prohibited – the protocol provides that all environmental impacts of upcoming activities be evaluated before the activities are undertaken, and that emergency plans be drawn out in case of environmental emergency.

Together, the Treaty, Protocol and Conventions, as well as the measures that derive from them, constitute the Antarctic Treaty system.

The ***Committee for Environmental Protection*** was created within the Protocol's framework in order to help the Parties implement it.

GLOSSARY

Sea Ice: Sea ice, as its name indicated is frozen sea water. It forms during the polar winter, when the salt water temperature reaches below 28.8°F (-1.8°C). In the heart of winter, the ice can be more than ten feet deep.

Ablation: When the temperature rises, the sea ice gradually thins out. At a certain point, it becomes subject to the movements of the sea, and it starts to break down into large floes of ice, and then into smaller floes. Water mammals like the seals often lounge on these floes to rest and sunbathe.

Freezing: The ocean freezes and the sea ice forms again. *(Opp: ablation)*

Ice: Ice is water that has become solid, crystallized or frozen. It is one of the three naturals states of water. Pure water freezes at 32°F (0°C). The other two states of water are liquid and gas (steam, beyond 212°F/100°C).

Hummok: Small pressure ridges of ice between two floes.

Oamok: Term coined from the words *Oasis* and *Hummok* to designate the area which the penguins occupy during the breeding season.

Krill: Small crustacean, about 2 to 3 inches long, and weighing 2 grams (less than $1/10^{th}$ of an ounce), with a slightly greenish almost transparent body with red dots and big black eyes. It feeds on phytoplankton and can live up to six years. There are 85 species of krill in the world. They live in huge schools close to the ocean's surface. These swarms can reach up to two million tons and spread out over 175 square miles.

With estimates of about 650 million tons, there are more krill on the planet than any other species. The Antarctica krill, which lives in the Southern ocean, is called *Euphausia superba*. It is essential to the feeding chain: calamari, sea mammals, bird, and fish feed on it, even though it has a very low yield – in order to gain one pound of body weight, they have to absorb 100 pounds of krill!

Polynya: Area of water surrounded by sea ice.

Giant Petrel: Web-footed seabird which appears on the list of endangered species of the French Overseas Territories.

Rookery: Colony of penguins (emperor and others)

Sastrugi: Waves formed on the ice by the wind.

Katabatic Winds: (from the Greek *cata* which means "towards the bottom"); these very cold winds can be found anywhere in the world, so long as the course of the colder air encounters a significant slope (the colder the air, the heavier it is), but it is nowhere stronger than in Antarctica. Under the effect of the slope of the polar ice cap, the winds roll towards the coast through the force of gravity, in an almost constant direction.

LINKS: Institut Polaire Français Paul Émile Victor: http://www.ifremer.fr/ifrtp/
Antarctic Treaty: http://www.ifremer.fr/ifrtp/pages/texteslois/traite.html
Protocpl of Madrid: http://www.ifremer.fr/ifrtp/pages/texteslois/protomad.html
Chizé Center for Biolgogical Studies: www.cebc.cnrs.fr

BIOGRAPHY

LUC JACQUET

Prize-winning filmmaker, documentarian, cameraman and photographer Luc Jacquet is renowned for his nature and wildlife documentaries, which draw heavily on both his scientific background and his great talent for filmed narrative.

NATURE DOCUMENTARY FILMS

DIRECTOR AND CINEMATOGRAPHER

" SHEDAO, L'ÎLE DES SERPENTS IMMORTELS"
France Cinq / Mona Lisa Production, S16 mm / Digital Beta, 2002

"LA TIQUE ET L'OISEAU "
France 3 / National Geographic / St.Thomas Production / Mona Lisa Production, S16 mm, 2002

" UNE PLAGE ET TROP DE MANCHOTS "
La Cinquième / National Geographic / St.Thomas Production, S16 mm / Digital Beta, 1997-2000
- Special Jury Prize, Nature Film Festival, Ménigoute 2001

" LA PART DE L'OGRE (LA CHASSE DU LÉOPARD DE MER) "
Canal +, Digital Beta, 1998-1999
- Silver Flipper at the Festival Mondial de l'Image Sous Marine, Antibes, 1999
- Merit Award for Underwater Picture & for Original Score at the Missoula International Film Festival, Missoula, Montana (USA) 2000
- Best Director at the International Film Festival on the Environment and Natural Heritage, Prague, 2001

" LE PRINTEMPS DES PHOQUES DE WEDDELL "
Canal+ / St. Thomas production, S16 mm, 1996
- Best Underwater Photography, Toulon Film Festival, 1996
- Audience Award, Autrans Film Festival, 1996

" ENTRE LES RATS ET LES MANCHOTS "
SFRS, Digital Beta, 1996

CINEMATOGRAPHER

" L'ART DE VIVRE D'UNE BALEINE TUEUSE"
BBC / Canal+ / NHK / St. Thomas production, Digital Beta, 1997

" THE VULTURE AND THE SPERM WHALE"
St. Thomas production, S16 mm, 1997-2000

" MONSIEUR CINCLE "
Canal+ / Aster, Beta SP, Directed by JP Macchioni, 1996

" LES LÉZARDS "
Canal+ / Aster, Beta SP, Directed by JP Macchioni, 1996

" LES HIRONDELLES "
Canal+ / Aster, Beta SP, Directed by JP Macchioni, 1996

“ LES CHAMOIS ”
Canal+ / Aster, Beta SP, Directed by JP Macchioni, 1996

“ RENARD, BLAIREAU ET COMPAGNIE ”
Canal+ / Aster, Beta SP, Directed by JP Macchioni, 1995

“ LE TRITON ET LA SALAMANDRE ”
Canal+ / Aster, Beta SP, Directed by JP Macchioni, 1995

DOCUMENTARY FILMS

“ L’ASTROLABE EN TERRE ADÉLIE ”
Scientific Exploration Documentary,
France 3 / Thalassa, 1998-1999

“ CAMILLE À LA MONTAGNE ”
Nature Series for Children
Canal J / Aster, 12 X 6min, Beta SP, 1996

“ UN VOYAGE EN AUTRICHE ,” “ Vienne ,” “ Salzbourg ”
Discovery Series
St Thomas Production/ Warner Vidéo, 3 x 52 min, Beta SP, 1995

“ LETTRES AUSTRALES ”
Adventure Essay
U-matic, 1993

MISCELLANEOUS

“ ANIMAL ZONE ”
Weekly Nature Magazine
BBC / France 2 / Léo Production, 1998
Scientific Editor for the first 12 programs

“ MÉFIE TOI DE L’EAU QUI DORT ”
Lazennec productions, Directed by J. Deschamps, 1996
Technical Consultant for the Animal Shoot

“ PAULINE À LA FERME ”
Nature Series for Children
Canal J / Aster, 12 X 6min, Beta SP, 1995
Cinematographer

“ LE CONGRÈS DES PINGOUINS ”
Ariane Films / Arte, Directed by H.U. Schlumpf, 1992
Antarctica Cinematographer

JOURNALISM

Editor of the monthly “ Carnet de saison ” in TERRE SAUVAGE MAGAZINE

PHOTOGRAPHY

Free Lance for FIGARO MAGAZINE, BIOS AGENCY

Finalist for “WILDLIFE PHOTOGRAPHER OF THE YEAR” 1993

TECHNICAL CAMERA TRAINING

Camera 35mm, Zurich, 1991
Camera 16mm/S16mm, ENS Louis LUMIERE, 1993
Camera Digital Betacam, Sony France, 1997

SCIENTIFIC TRAINING

- MASTER IN ANIMAL BIOLOGY, specialized in Ecology and Animal Behavior
- Lyon 1 University, 1991

- DOCTORATE IN NATURAL MOUNTAIN HABITAT MANAGEMENT, Grenoble 1 University, 1994. 6-month internship at the Inra-SAD in Toulouse focusing on the influence of agricultural practices on vegetation in the Oô Valley.

- Researcher at the CNRS in POLAR BIRD ECOLOGY, 14-month stay in Terre Adélie, Antarctica, under the direction of Professor P. Jouventin, 1991-1993

- Many field research trips to study animal behavior (alpine marmots, birds, bats, etc…)

Internet Website: www.luc-jacquet.com

BONNE PIOCHE

BONNE PIOCHE was created in 1994 by Yves Darondeau, Christophe Lioud and Emmanuel Priou. Their common desire was to produce tailor-made films that would bring together elements of curiosity, passion and human adventure.

BONNE PIOCHE has thus produced many personal films, artists' portraits, musical programs, and numerous documentaries on major social issues, for all the major French and European networks.

Since 2003, BONNE PIOCHE has developed an international partnership with among others, *Nova/WGBH, National Geographic International, Discovery Canada, Channel 4…)*

BONNE PIOCHE is among the 10 French production companies nominated to the *Prix de la PROCIREP* 2003.

With "March of the Penguins," BONNE PIOCHE delivers its first feature-length film.

The company is currently in production on "Au bout de mes Rêves," Priscilla Telmon and Thierry Robert's next film, slated for release at the end of 2005.

Recent Productions:

ON A MARCHÉ SUR MARS
By GREG LANNING AND LAURENT LICHTENSTEIN (60')

VOYAGE AU CENTRE DE LA PIERRE
BY NICOLAS GABRIEL (52')

NYIRAGONGO, UN VOLCAN DANS LA VILLE
BY ANTOINE DE MAXIMY (52')

IRAK, LA GUERRE DANS LES MEDIAS
BY AXEL CHARLES-MESSANCE AND YVES DE CHAZOURNES (52')

BERNARD LAVILLIERS: AMERICAS
BY XAVIER FISCHER (52')

MC PIETRAGALLA, SAKOUNTALA
BY MATHIAS LEDOUX (90')

CES ANIMAUX QUI NOUS DÉRANGENT
BY B. VICTOR PUJEBET, K. KÉZADRI, B. GUERRINI AND T L. MARESCOT (5X52')

J'IRAI DORMIR CHEZ VOUS
BY ANTOINE DE MAXIMY (9X52')

LES TRÉSORS MAUDITS DE L'ALTIPLANO
BY DOMINIQUE LENGLARD (52')

L'ANNÉE CLASSE D"ÉRIC ET RAMZY
BY B. PINAY, (90')

To re-capture the emotion and the magic of the film, look through three books and a sticker-volume to be published by Hachette Jeunesse on January 12, 2005. Adapted to different age groups, with beautiful photographs and informational cards, these books will help the youngest children understand the extraordinary story of "March of the Penguins."

SOUND (DESIGN) Laurent Quaglio
Les Triplettes de Belleville (2003)
Dead End (2003)
Vatel (2000)
The Ninth Gate (1999)
Serial Lover (1998)
Le Bossu (1997)
Death and the Maiden (1995)
Bitter Moon (1992)
The Bear (1988)
Manon des Sources (1987)
Jean de Florette (1986)

SOUND (MIX) Gérard Lamps
Monsieur Abrahim et les Fleurs du Coran (2003)
Stupeur et Tremblements aka Fear and Trembling (2003)
Mon Idole (2002)
Une Femme de Menage (2002)
Laissez-passer (2002)
Le Peuple Migrateur (2001)
Belphégor (2001)
Harry, He's Here to Help (2000)
Léon (1994)
Daddy Nostalgie (1990)
Nikita (1990)
Jean de Florette (1986)

ORIGINAL MUSIC Alex Wurman

ALEX WURMAN credits his facility and wide range of styles in composition to his early classical training, a lifelong love of jazz, and an expert knowledge of the most advanced technology. His is a talent that can be attributed to both genetics and environmental circumstance as he hails from a family that has spent generations devoted to the study and performance of music.

Alex can trace his desire to work in the field of film scoring to afternoons spent at his father's workplace. Hans Wurman is an arranger composer who not only pioneered the world of electronic music by recording intricate works on the first Moog synthesizer, but also was the owner of a thriving business recording radio plays featuring such well-known actors as Richard Burton, James Earl Jones and Woody Allen.

Alex then attended the Academy of Performing Arts high school in Chicago and went on to study composition at the University of Miami in Coral Gables and the American Conservatory of Music in Chicago. While in Chicago, Alex performed with such artist as Stanley Turrentine and Bobby Broom.

Film scoring seemed to be the natural evolution for Alex's talent, and after a stint in the commercial/ad world, he moved to Los Angeles to pursue this new career path. He immediately got work scoring AFI student films. During this time, Alex met Hans Zimmer and began working with the esteemed composer by providing composition and arranging services. Alex had the opportunity to contribute to the blockbuster hits "A League of Their Own", "The Lion King" and "Armageddon." This proved to be the launching pad for his independent career.

Soon, assignments came his way from the indie world as directors discovered a fresh and versatile composer who gave their films depth with his music.

Alex made the leap to major studio releases with the scores to “Confessions of A Dangerous Mind” (Miramax) and “Hollywood Homicide” (Sony/Revolution). The two scores couldn’t be farther apart stylistically. The eerie, spare piano melodies of “Confessions…” are miles away from the lush 85 piece orchestral chases of “Hollywood Homicide,” however diversity has been one of the hallmarks of what is becoming an exceptional career. If one considers his avant-heartland score to the emmy nominated HBO film “Normal” (Jessica Lange, Tom Wilkinson, coupled with the outrageous comedy “Anchorman: The Legend of Ron Burgundy,” (Dreamworks, Will Ferrell) it becomes even more difficult to categorize his work.

NARRATION WRITTEN BY Jordan Roberts

Jordan Robert’s feature film directorial debut was 2004’s “Around the Bend.” Among the projects on which he has written are “Road to Perdition,” “Barnes,” “Bye Bye Brooklyn” and “Mr. Lucky.”

AS TOLD BY Morgan Freeman

Morgan Freeman became known nationally when he created the popular character, "Easy Reader", on CTW's highly praised children's show, "The Electric Company". He then won the Drama Desk Award, the Clarence Derwent Award and received a Tony Award Nomination for his outstanding performance in "The Mighty Gents" in 1978, and received more acclaim and an Obie Award for his appearance as the Shakespearean anti-hero, 'Coriolanus', at the New York Shakespeare Festival.

In 1984, Morgan won an additional Obie for his role as 'The Messenger' in the acclaimed Brooklyn Academy of Music production of Lee Breuer's "Gospel at Colonus". In 1985, he was awarded the Dramalogue Award for the same role. Then the role of 'Hoke Coleburn' in Alfred Uhry's Pulitzer Prize-winning play, "Driving Miss Daisy" won him his third Obie Award. His last stage appearance was as 'Petruchio' in "The Taming of the Shrew" at the New York Shakespeare Festival's Delacorte Theater with Tracey Ullman. Freeman's numerous television credits include, "The Atlanta Child Murders" and "The Execution of Raymond Graham". In 1993, Freeman made his film directorial debut with "Bopha!", starring Danny Glover and Alfre Woodard, and soon after formed Revelations Entertainment, a production company developing entertainment product in all existing and emerging media that "enlightens, inspires and glorifies the human experience."

Other film acting credits include: "Brubaker"; "Eyewitness"; "Harry & Sons"; "Teachers"; "Marie"; "That Was Then, This Is Now"; "Street Smart"; (for which won the LA, N.Y., and National Society of Film Critics Awards for best supporting actor of 1987, and was nominated for a Golden Globe award and an Academy Award); "Clean & Sober"; "Johnny Handsome"; "Glory"; "Driving Miss Daisy" (for which Mr. Freeman won his second Academy Award nomination and a Golden Globe Award, and The Silver Bear for best actor at the Berlin Film Festival); as well as "Chain Reaction”, "Kiss the Girls”, the Steven Spielberg production, "Amistad" ; Paramount productions "Hard Rain", "Deep Impact " , "Nurse Betty”, “Along Came a Spider”, "Kiss the Girls" , "High Crimes", "The Sum of All Fears" and Warner Bros’ “Dreamcatcher” and ‘The Big Boune’.

Morgan’s latest success, the Warner Brothers Clint Eastwood-directed hit, ‘Million Dollar Baby’ has earned him a Golden Globe nomination, a SAG award and an Oscar for Best Supporting Actor. Currently, with Bob Hoskins and Jet Li, Morgan stars in the action-drama ‘Unleased’. Morgan’s turn with producer/actor Robert Redford, and Jennifer Lopez , “An Unfinished Life” will be released in the fall of 2005, along with “Edison” starring LLCool J, Kevin Spacey and Justin Timberlake.

And then of course, there’s Morgan as Lucious Fox in ‘Batman Begins’, due in theaters in June 2005.

DIRECTORS OF PHOTOGRAPHY Laurent Chalet, Jérôme Maison

EDITOR Sabine Emiliani

NATIONAL GEOGRAPHIC FEATURE FILMS

National Geographic Feature Films, which acquires, develops and produces theatrical motion pictures, is a division of the National Geographic Society, one of the world's largest nonprofit scientific and educational organizations. Founded in 1888, its mission is to increase and diffuse geographic knowledge while promoting the conservation of the world's cultural, historical and natural resources. National Geographic reflects the world through its official journal National Geographic and four other magazines; television documentaries and other programs; feature films; kids programming; radio; books; videos; maps; interactive media; and merchandise.

National Geographic has funded nearly 8,000 scientific research projects and supports an education program combating geography illiteracy. For more information, log on to nationalgeographic.com; AOL Keyword: NatGeo.

Emperor Penguin A Quick Overview

Captive population:
Sea World California/San Diego, Port of Nagoya Public Aquarium
emperors are rarely kept in captivity. Currently, Sea World/San Diego and the Port of Nagoya Public Aquarium in Japan are the only facilities in the world to keep them. Sea World currently maintains a group of about 50 emperor penguins.

In the Wild:
Main breeding populations, all on Antarctica:
Cape Washington 20-25,000 pairs, Coulman Island – Victoria Land 21,000 pairs, Halley Bay - Coats Land 14,300-31,400 pairs, and Akta Bay - Dronning Maud Land 16,000. Breeding reported at 42 colonies. Total population: roughly estimated about 400,000.

Appearance:
Males and females look essentially the same. Both grow to almost four feet tall. Males can weigh 70 pounds, females slightly less.

Habitat:
Largely restricted to the pack ice region of Antarctic. Breeding colonies occur mainly on level areas of stable (fast) sea-ice, either close to the coast or up to 18 km offshore, amongst closely packed, grounded icebergs which prevent the ice from breaking up during breeding season. Other colonies are located in sheltered sites in lee of ice cliffs, hills, or bergs.

Some colonies have access to relatively close open water via perennially open patches of water (called "polynyas") amidst the ice. In other cases the birds gain water access via cracks in the ice formed by tidal variations or through breathing holes maintained by seals. Most often, however, the open water is quite some distance away across the sea ice – in winter time, the open water can be 50 miles (81 km) or more from the colony.

Two colonies are known to breed on land -- at Dion Island on a low-lying spit of land (surrounded by ice) and at Taylor Glacier on a low, rocky headland.

Food:
Mainly eat small fish, squid and crustaceans. Fish and squid are captured by pursuit diving to depths of 1750 feet, sometimes at or near the sea bottom; may also feed on the under surface of sea-ice for crustaceans. Emperors can travel from 90 to up to 870 miles in a single foraging trip.

Breeding and life cycle:
The birds spend January to March at sea. They return to the colonies March – early April. This coincides with formation of the winter sea-ice. Often the birds have to travel 31-75 miles (50 to 120km) over the ice to reach their colony site.

Between May and early June they lay a single large egg. The birds are highly colonial, but no nest site or territory is defended. The adults typically associate in large groups or "huddles" especially during incubation. Following the laying of the egg, females return to sea (usu. about 40 days after their arrival at the colony) and the males take over responsibility for the entire incubation period of the egg (~65 days). Pair are monogamous during the breeding season, but pair fidelity between breeding seasons is very low (15%).

Males fast for about 115 days between their arrival at the colony and the end of incubation period. The chicks are born relatively helpless and rely on their parents for warmth. Over-long exposure to the elements in their first weeks means death. The male broods the chick for about

10 days following hatching, then turns it over to the female. Females return to the colony after about two months at sea and both parents help brood the chick for 45-50 days post-hatching. During this time the parents make alternating trips to the ocean to catch food for the chick. If the female is late in returning to the colony, the male can secrete a milky substance from the walls of its throat to feed the chick until the female arrives with food (Chicks are able to double their bodyweight on this food alone, if necessary). Chicks start to spend time outside the incubation pouch at about 1 month of age.

As they mature, the chicks congregate in large groups -- called “creches.” This starts to occur once the chicks reach 45-50 days old. In creche they are still visited by their parents who continue to bring them food. As the spring/summer returns, the frequency of the parental feeding visits to chicks increases, because the sea-ice is receding and the parents do not have as far to travel to find open water and food. Chicks start to molt in early November. Adults stop feeding the chick and leave the colony prior to the completion of the molt. Finally, in December or early January the chicks depart for the sea for the first time. By that point the chicks are about 150 days old.

About 74% of chicks survive this long. Main causes of death among chicks are blizzards/exposure, starvation (parent fails to return from hunting), falling into tidal ice cracks, and predation by giant petrels. After fledging the chicks main enemies are Antarctic skuas, leopard seals, and orcas. The latter two also prey on adults, though with less success.

Chicks do not breed until about 5 years old. On average they do not return to the colony for the first time until they are over 4 years old. The minimum survival rate for the first year after fledging is about 19%. The mean annual survival rate of adults is 95.1%. Mean longevity is 19.9 years. If the youngsters can get through their first year, they have an excellent chance (by animal standards) of a long life.

Molting:

Adults molt annually between November and February. Fledglings molt in early November in preparation for their first summer in the sea.

Conservation Issues:
“Our tuxedoed friends living near the South Pole don't appear to be fans of global warming. The number of emperor penguins living in a colony near an Antarctic research station has dropped 50 percent in the past five decades, French scientists report. The onset of the population decline coincides closely with a regional warming trend and a reduction in sea ice that started in the 1970s. The scientists say that increasing temperatures may have reduced the number of krill (a shrimp-like, cold-water crustacean), making it difficult for the seabirds to get enough food to eat. Although the study isn't conclusive, biologist Christophe Barbraud says, "our results suggest that emperor penguins may be highly sensitive to climate change."”

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Emperor Penguin breeding and life cycle – 1 year timeline:

January to March:	Emperors at sea foraging and feeding.
March – early April:	Emperor adults return to the colonies. This coincides with formation of the winter sea-ice. Courtship begins.
May:	Mating occurs.
May - early June:	Females lay a single egg.
May – early June:	Following the laying of the egg, females transfer eggs to males. Males incubate eggs, females return to sea to feed.
June-July:	Males form large groups called “huddles” for warmth
July-early August:	Chicks hatch – under males’ care.
Mid-July-early Aug:	Females return and take over the care of chicks – usually within 10 days of hatching. Males head to sea to feed – have fasted since arrival at colony.
August-early Sept.:	Chicks start to spend time outside of parents’ incubation pouch.
August-November:	Adults alternate trips to sea to hunt for the chick.
Late Aug.-Sept:	Chicks form “creches” for warmth, protection. Adults now make simultaneous trips to hunt for the chick.
November:	Chicks begin to molt.
November:	Adults leave colony and return to sea for the summer. The chicks are on their own.
December-early Jan:	Chicks leave colony for the sea.
January-early Feb:	Adults molt.

# # #

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