

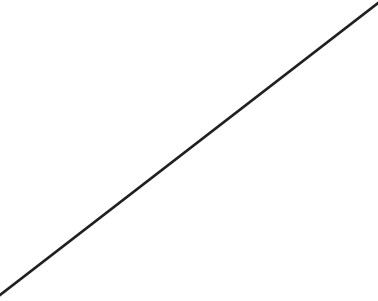
Feed.

JERÓNIMO MARTINS WORLD'S MAGAZINE

N7.
JUN 2019

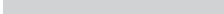
DEEP

D E E P



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DEEP

D E E P

From the depth hidden behind the human eye to the vastness of the cosmos, “deep” means to go further in questioning the very essence of what is – and is not – within the reach of our senses. It means paying attention, listening closer, loving and committing more.

Feed.

JERÓNIMO MARTINS WORLD'S MAGAZINE

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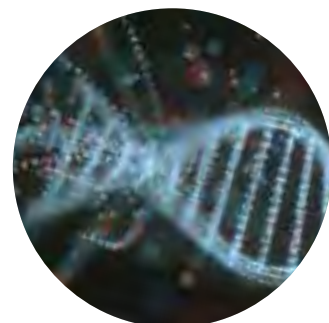
GIVING FISH A CHANCE

14.21

Mankind has been pushing the oceans to their natural limits by catching fish faster than stocks can replenish. However, there are sustainable fishing strategies to keep providing quality seafood without compromising our common future.

PIG IN A POKE

30.33



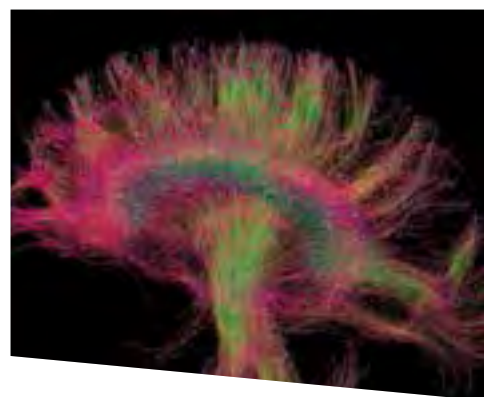
Food fraud and product adulteration goes back millennia. And the best way to fight it is by going deep into analyzing the food, namely through DNA tests.



48.65

TIME FOR MOZAMBIQUE

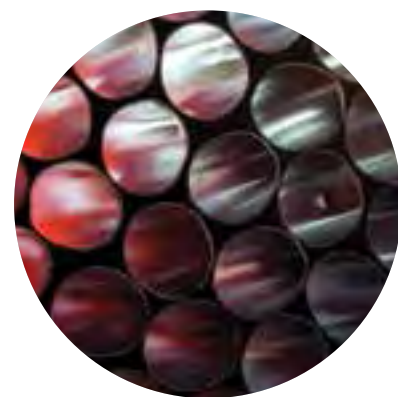
On the night of the 14th of March one of the worst weather-related disasters ever to hit the southern hemisphere made landfall near the port city of Beira. More than a million were affected by the storm and 100 thousand homes were destroyed. Portuguese society quickly deployed several aid initiatives. Feed was inside one of these missions.



DEEP LEARNING

34.43

Due to the fast developments in artificial intelligence, machines are now taking over complex jobs we previously thought only humans could do. More than ever society must answer complex ethical and philosophical questions.



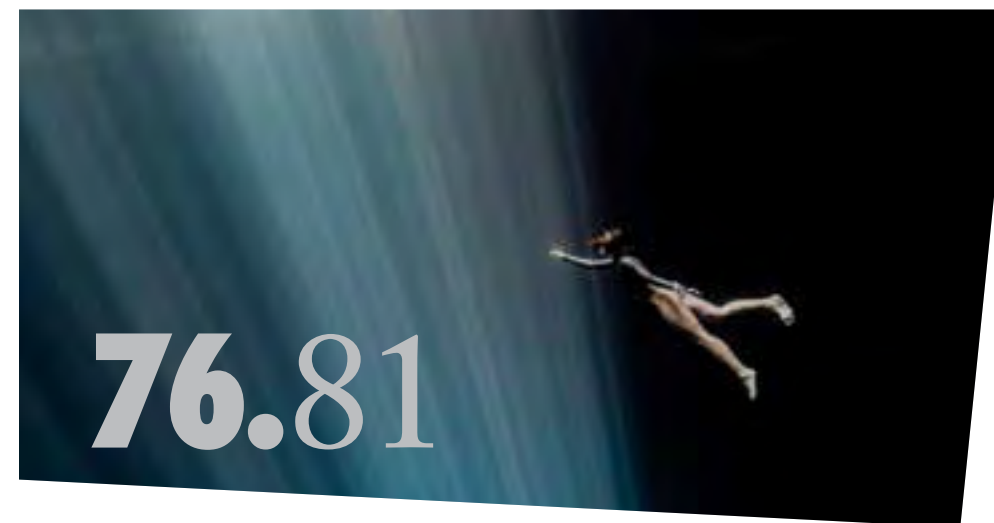
THE FINAL STRAW

66.71

Plastics' old problems cry for new solutions. Here's how companies are finding new ways of recovering plastic waste and transforming it into new products.

DISTURBING. THRILLING. MAGICAL.

And more. Going deep means jumping from the very edge of our visible world into a galaxy of countless questions. At Jerónimo Martins we wish this Feed issue may take you through some unexpected paths of discovery.



76.81

DEEP BREATH

Sofía Gómez is one of Colombia's most tenacious female athletes, holding the record for the deepest free dive with two fins at 83 meters of depth. At the same time, Sofia gets completely engaged in a mission to defend the environment she's so connected with.



FROM FIELD TO SPOON

82.87

In the country that is the largest soup consumer in Europe, we take a look at the biggest soup factory of the Group. At the same time, chef Kuba Kuron replicates some of Poland's favorite traditional soups available in Biedronka stores.

IN SEARCH FOR PURPOSE

88.93



Project Search plays a decisive role in the inclusion of young people and adults with disabilities into the job market. Deeply committed to this cause, Jerónimo Martins is preparing those in need for the professional future ahead.



A THOUSAND MINES

120.129

Underneath its surface, Earth displays a rich and mysterious environment, full of stories from the past and resources for the future. Portugal, Colombia and Poland. Lithium, Emeralds and Coal. Three reports from the deep.

AND MORE...

22.29

HIDDEN WONDERS

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Feed.

JERÓNIMO MARTINS WORLD'S MAGAZINE

CONTRIBUTORS.



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*CÂNDIDA
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**JOURNALIST,
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Cândida Pinto is a reporter living and working in Lisbon. She started her career on the radio, and later moved to television through RTP, the public TV network. In the early 90's, she founded the first Portuguese private TV – SIC –, where she was also International news editor and a coordinator for the Special Report show. She was director of SIC Notícias, the SIC news cable channel, and Assistant Director of Expresso weekly newspaper. She received several national and international awards. In 2019, back in RTP, she became Assistant Director of Information.



*HORTENSIA
ESTRADA*

**PROFESSOR
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Hortensia has a degree in Literature and Languages from the Universidad Santiago de Cali and a Master's degree in Ethnolinguistics from the Universidad de los Andes. Estrada is also an investigator of “Colombian languages (indigenous, Afro-diasporic, Roma and sign)” at the Caro y Cuervo Institute. She collaborated in the ethno-education program for the Sáliba community in the design of a practical spelling for writing the language and in training indigenous teachers in the grammatical study of the Sáliba language.



*LUIS GONZALO
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**PROFESSOR,
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Luis Gonzalo Jaramillo is an Associate Professor at the Department of Anthropology of the University of the Andes. Graduated in Archaeology by the National University of Colombia, he also holds a graduate certificate in Latin American Studies and a Master of Arts from Pittsburg University, having completed a Doctorate of Philosophy in the same University. He was the Academic Coordinator of Taller Internacional Arqueología and is author of the book “Theaters of Memories”.



*ŁUKASZ
RAWA*

**EDITOR,
WIADOMOŚCI HANDLOWE**

Łukasz Rawa is an editor of the magazine “Wiadomości Handlowe” (“Trade News”) and the wiadomoscihandlowe.pl news portal. Previously, he worked for the PTWP Group as a portalspozywczy.pl and “Rynek Spożywczy” magazine journalist. He also worked with “Nowy Przemysł”, “Bilans Dodatni”, “The City”, “Audio” and with Polish Radio Online. Since 2016, he has been an organiser of the “Meat Congress”, the most important annual conference dedicated to the meat sector.



*HUGO
LAMI*

**VISUAL
ARTIST**

Hugo Lami is a Portuguese visual artist living and working between London and Lisbon. He has a degree in painting from the Faculty of Fine Arts in Lisbon and a Masters in Sculpture from the Royal College of Art in London. Lami has been exhibiting his work since 2014 across several galleries and institutions across Europe. His sketchbook is a must in his backpack, always ready to sketch ideas or what he sees and wants to remember. “A drawing contains more memory than most of the photographs”.



*JUAN SANTIAGO
GALLEGO*

**CHEF,
LA CHAGRA**

Chef graduated from the Gastronomic School of Antioquia (ESGANT) and the owner of La Chagra, one of the most recognized restaurants in Colombia. Juan Santiago Gallego considers himself a lover of nature and of the Amazonian rainforest, a love that took him traveling through Amazonas to personally know its flora, culture, and variety of foods. His goal has always been to transmit the Amazonian culture, the problems that threaten the “lungs of the world” and promote its conversation through his dishes. This is the main reason why El Chagra was born.



*KUBA,
KURON*

**CHEF,
COOKERY COACH**

For the past 12 years, Chef Kuba Kuron has been running workshops, cooking shows, training sessions as well as events for companies and organised groups. He likes to experiment with new cooking techniques, such as molecular gastronomy, but he also looks for inspiration in forgotten cookery books and old recipes, including recipes inherited from his own family. Kuba has his own cookery show on YouTube and is the author of many cookery books and culinary articles for newspapers and magazines.



*MANUEL
LINO*

**PHOTOJOURNALIST,
VIDEOGRAPHER
AND MULTIMEDIA ARTIST**

Manuel Lino has been working as a photojournalist since 2006 in communication media such as TVI, IOL or Myspace. Also studied multimedia technologies and is developing video and photography for advertising, editorials, products and institutional projects.



*PEDRO
BELLO MORAES*

**JOURNALIST,
TVI**

Pedro Bello Moraes started his career in writing, first for a weekly magazine, then for a newspaper and finally moving to television. He is now a senior reporter in international news desk at TVI. As a journalist, Pedro says that his profession is to tell stories. In the last 20 years he dedicated those stories to people, to those who generate the news and those who suffer the consequences of the news events, both of which he encompasses in the Report gender.

Editorial.



PEDRO
SOARES
DOS
SANTOS

INTO THE DEEP

In many ways how we choose to react to an unexpected event or some undesired circumstances can define us. Our instincts, our gut feeling, the decisions we make in a blink can have an enormous impact in the life of many people.

In Portugal, the news about the devastation in Mozambique brought by cyclone Idai left no one indifferent. The thought of how unfair it is for a land with so many difficulties to be hit by such a tragedy must have been in everyone's minds.

At Jerónimo Martins, we immediately decided to take action, and in this edition of "Feed" we tell you the story of a special and memorable trip. It was this profound will to help Mozambique that inspired us to approach the idea of depth from different angles. When you think of something deep it first comes to your mind something that is laying, maybe hidden, below surface. Or even stuck, like the manmade litter (apparently plastic) that was found in the deepest place on Earth, the Mariana Trench.

But it goes beyond that. Depth is also about strong relationships and core values. Like the ones that fuel Project Search which makes us so proud. It's about long-lasting traditions - such as some recipes in Poland, where vegetables and tubers soups are mandatory in millions of homes - that we invited a chef to reinvent. And it's, naturally, about the ocean, so deeply essential to life in planet Earth. We invite you to get to know a bit more about how committed we are to promoting marine preservation, namely through our aquaculture business.

There are also many treasures buried in land and humankind has been exploring them for a long time. You will like to read more on how important lithium, coal and emeralds are for "our" countries: Portugal, Poland and Colombia. As a food business, we can never go deep enough when it comes to assuring food safety and integrity. That's why we invest a lot in voluntary DNA tests to the products, to make sure they are as trustworthy as they should and must be. I hope you enjoy this journey through some unexpected places and inspiring people. ●

Pedro Soares dos Santos,
Chairman of the Jerónimo Martins Group

When you
think of
something deep
it first comes
to your mind
something
that is laying,
maybe hidden,
below surface.
But it goes
beyond
that.

Fresh*in*

NEWS FROM OUR WORLD

RETHINKING SOCIETY'S PHILOSOPHY IN THE NEW INTER-AMERICAN CONGRESS

Science and technology have had a major impact on society by drastically changing our means of communication, the way we work, our consumption, and, indeed, the moral values and basic philosophies of mankind. The XVIII Inter-American Congress of Philosophy, that will take place in Bogota, Colombia, from 15th to 18th October, will bring these subjects to discussion with speakers from all over the world. Gender and Feminist Philosophy, Metaphysics, Latin American Philosophy, Philosophy of Education, Ethics, Phenomenology and Critical Theory are just some of the topics.

The Congress began in 1944 with the meeting held in Haiti as a joint venture of the Inter-American Society of Philosophy and the Colombian Society of Philosophy. Since then, it has been held in different cities, among which are New York, Buenos Aires, Mexico City and Lima. In previous editions, philosophers have addressed topics such as Philosophy in the Contemporary World, Knowledge, Virtue and Pluralism, and Tolerance.



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1.

The congress will take place in Bogota in October.

TRASH IN THE DEEPEST PLACE ON EARTH?



© Thomas J Abercrombie / Getty Images

In a mission to chart the world's deepest underwater places, the American Victor Vescovo completed what is claimed to be the deepest dive ever made by a human in a submarine. The Texas businessman plunged 10,927 meters to the bottom of the Mariana Trench, where he found manmade litter, apparently plastic. While his team is still trying to confirm precisely what it is, "National Geographic" pointed out that this may be "the third time plastic has been documented in the deepest explored part of the ocean". This was the fourth dive of a series of five being filmed for a Discovery Channel documentary series – Deep Planet – that will air later this year. For Victor Vescovo, the Limiting Factor, a specially engineered submarine, "and its mother ship, along with an extraordinarily talented expedition team, took marine technology to an unprecedented level by diving – rapidly and repeatedly – into the deepest, harshest area of the ocean. We feel like we have just created, validated, and opened a powerful door to discover and visit any place, any time, in the ocean – which is 90% unexplored."

Explorers wave victoriously from a bathyscaph after a seven-mile dive, Mariana Trench, Pacific Ocean

2.



© whiteMeca / Shutterstock.com

3.

TRAINING DEEP LEARNING IN POLAND

Two international summer schools of deep learning will take place in Poland in July. The first one, from 1st to 5th, is at the city of Gdansk and the second one is scheduled to happen by the end of the month, from 22nd to 26th, in the Polish capital, Warsaw. Update participants about the most recent advances in the critical and fast developing area of deep learning is the main goal of these two training events. Deep learning is a branch of artificial intelligence covering a spectrum of current exciting machine learning research and industrial innovation that provides more efficient algorithms to deal with large-scale data in neurosciences, computer vision, speech recognition, language processing, human-computer interaction, drug discovery, biomedical informatics, healthcare, recommender systems, learning theory, robotics or games. Renowned academics and industry pioneers will lecture and share their views with the audience. These two summer schools are addressed not only to master's students, PhD students, and postdocs, but also industry practitioners and entrepreneurs.

Fresh*in*

NEWS FROM OUR WORLD

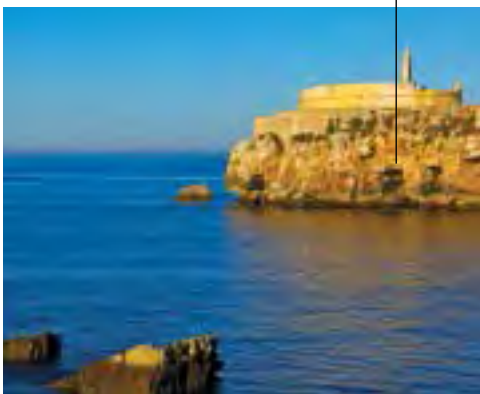


© Pauline Price / Getty Images

The museum opened on April 25, the day of the Carnation Revolution.

4. RESISTANCE AND FREEDOM MUSEUM IN PORTUGAL

The fortress was used to hold dissidents and opponents of the Portuguese dictatorial regime.



© MyLange / Getty Images

Portugal has now a National Museum of Resistance and Freedom in the notorious fortress where once was the Peniche political prison, in Leiria. It opened on April 2019, in the 45th anniversary of the closure of the building where it is situated. The 16th century construction, nestled among the rocks overlooking the Atlantic Ocean, was used to hold dissidents and opponents of Portugal's fascist regime between 1934 and 1974. Now it is the country's first national centre dedicated to this turbulent past, with an important role in teaching younger generations that their freedoms did not come without a cost. The inaugural exhibition at the museum took place on April 25, the day of the Carnation Revolution, alongside the unveiling of a "memory wall" inscribed with the names of the 2500 people who entered the prison during the Portuguese New State ("Estado Novo").

PINGO DOCE RELAUNCHES SOCIAL MARKET

5.



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Biscuits, jams, chocolates and many other delicacies. Until the end of the year, the taste of solidarity will meet Pingo Doce stores again in the second edition of its Social Market, following the pioneering project's successful launch in 2018. This time, four institutions will see the fine flavour of their products rewarded by Jerónimo Martins' supermarket chain. Cercica (Cooperative for the Education and Rehabilitation of Maladjusted Citizens of Cascais) and the Braga delegation of the Portuguese Red Cross joined Semear and Casa dos Sabores, which participated in the kick-off of the initiative. These institutions will be given the opportunity of selling their items at the Pingo Doce supermarkets of their sphere of influence. "The goal is to ensure that they have a source of sustainable revenue stream, evolving from a social assistance logic to a social business one, since the sales go entirely to the institutions", explains Isabel Pinto, CEO of Pingo Doce.

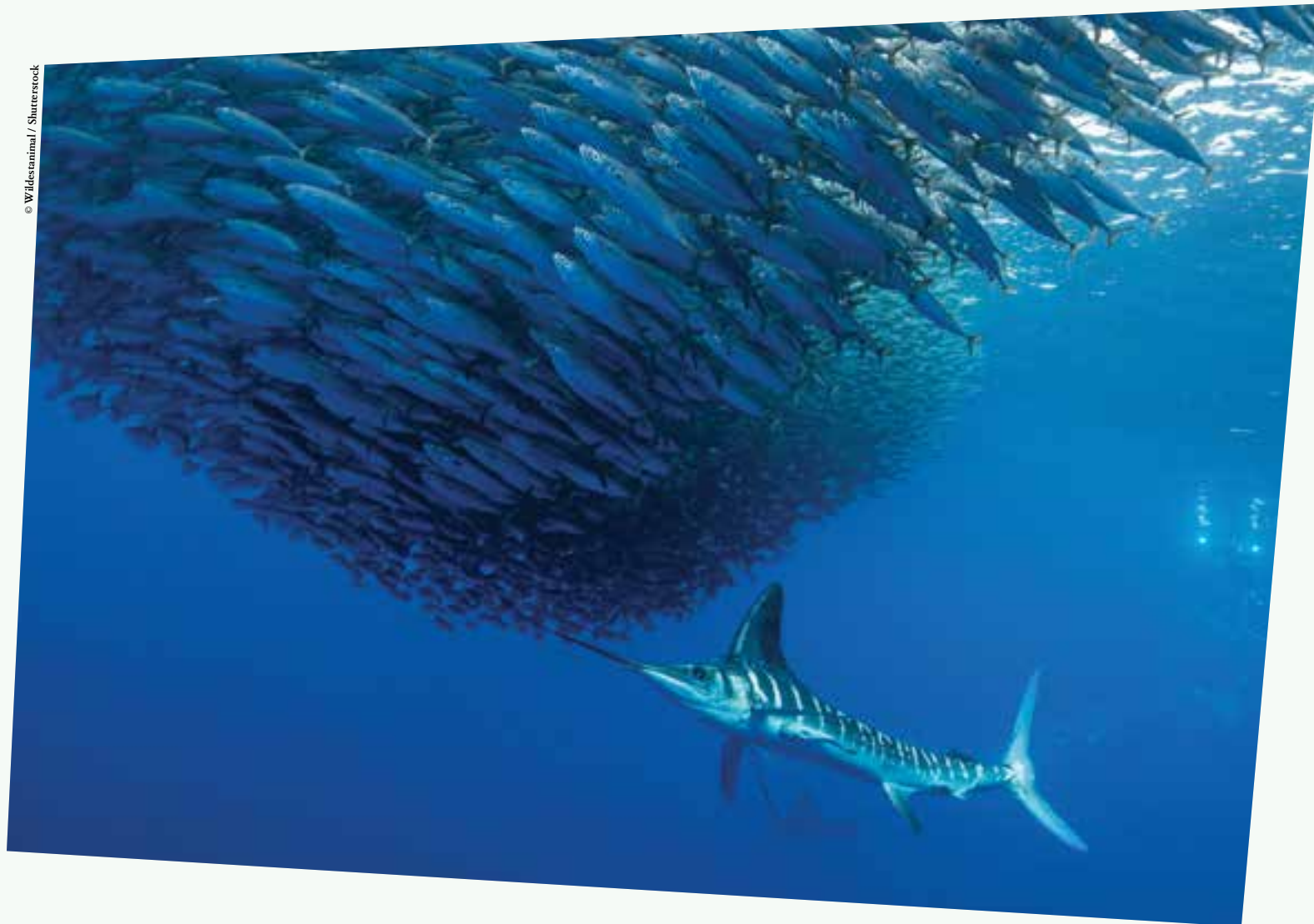


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All proceeds will go to the four institutions involved in this project.

GIVING FISH A CHANCE

Once there was a wondrous place full of light and life called the ocean. Over time, mankind pushed it to its natural limits by catching fish faster than stocks could replenish. A deep dive into Jerónimo Martins' sustainable fishing strategy shows it is possible to keep providing quality seafood solutions without compromising the future, and give this story a hopeful turn.



ON THE HOOK FOR A CHANGE

THE ocean is the largest and least explored habitat on Earth. This boundless reservoir of life covers over 70% of the surface of the planet, being home to an extraordinary diversity of millions of species, plant and animal, whose lives are dependent on its resources. More than 3 billion people in the world rely on fish as a major source of animal protein. Global fish production peaked at about 171 million tonnes in 2016, with aquaculture representing 47 percent of the total (The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals, FAO, 2018).

According to the same report, fisheries and aquaculture are worth 325 billion euros. As a result, apart from being essential for life, healthy oceans and responsible fisheries are of the utmost importance for a strong marine economy. However, since 1961, the annual global growth in fish consumption has been twice as high as the population growth and the level of current demand does not allow enough room for the natural regeneration of fish stocks. Several important commercial fish populations (such as Atlantic bluefin tuna) have declined to the point where their survival as a species is threatened. For Jerónimo Martins, which sells over 220 species in both Portugal and Poland, fish is a big deal. It could not be otherwise, considering the fish consumption numbers in the countries where the Group operates.

For Jerónimo Martins, which sells over 220 species in both Portugal and Poland, fish is a big deal.



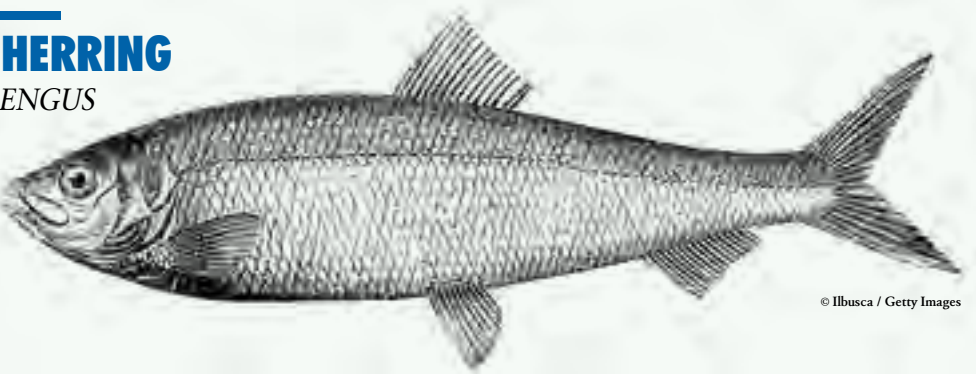
By keeping control over the aquaculture fish feeding, the Jerónimo Martins agri-business is able to avoid the presence of heavy metals or microplastics in its fish species.

Recently, the potential risks associated with the most sold species by Jerónimo Martins' companies were subject to an extensive analysis. The research of the level of stock exploitation, the impacts on ecosystems and surrounding communities, as well as the traceability and working conditions concluded that none of the species sold were at high risk. After assessing their degree of vulnerability, three actions to reduce the pressure on the threatened ones were defined: banning the purchase and sale of species classified as "Critically Endangered" and with no extraordinary permits; searching alternatives produced through

aquaculture for species classified as "In Danger"; and limiting promotional activities with species classified as "Vulnerable" that were not obtained from aquaculture and/or from sustainably managed stocks. For the Group, the most coveted species by consumers are herring (19%) - the "beef of the sea" -, cod (19%) and pollock (17%). In order to make sure it provides the freshest seafood to its customers and reinforce its role in the protection of fish stocks, the Group has been investing in aquaculture as a sustainable and healthy alternative to the consumption of wild fish since 2016.

GROUP'S TOP SELLING SPECIES

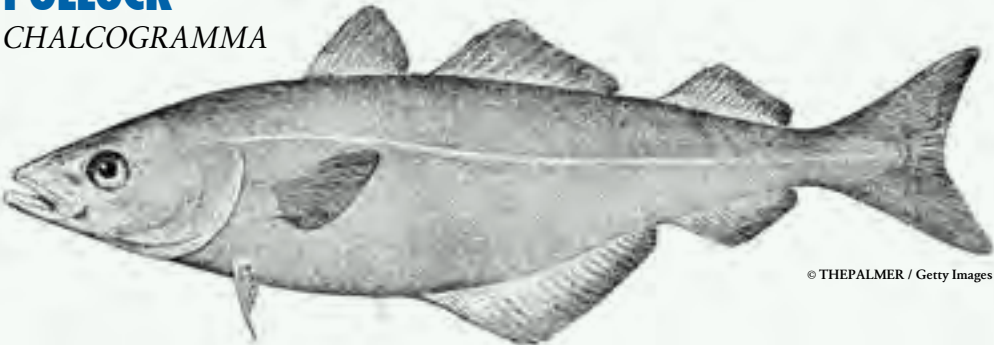
ATLANTIC HERRING
CLUPEA HARENGUS



ATLANTIC COD
GADUS MORHUA



ALLASCA POLLOCK
THERAGRA CHALCOGRAMMA



SUPPORTING TRADITION



Fishermen draw on the long line fishing technique, a passive one, to catch Scabbardfish.

BIEDRONKA'S COMMITMENT RECOGNISED BY MSC @Jerónimo Martins

Biedronka was awarded by the Marine Stewardship Council (MSC) with its "MSC 2018", which honoured best in class in the world of seafood sustainability. In 2018, the number of Private Brand fish products certified by the MSC's label in Biedronka stores had reached 27 references.

BY using more selective and less invasive methods, traditional fishing has permitted sustainable exploration of the oceans over the centuries. In Sesimbra, Portugal, fishing operators' cooperative Artesanal Pesca was founded in 1986 with the aim of adding value to the products of the sea caught traditionally and in a sustainable manner in the municipality. For instance, to catch Scabbardfish their fishermen draw on the long line fishing technique, a passive one, and thus, less harmful for the marine ecosystem. Besides, the use of whole Sardines or Mackerel as bait assures that young fish are virtually never caught. The organization also makes a difference in the promotion of fair trade, as it directly sells the fish caught by its members' vessels, guaranteeing better prices for their production and associates. Moreover, the centralisation of the catches provides market positioning, scale and security for the operators and fishermen that would otherwise be difficult to achieve. In 2008, Artesanal Pesca started working with Jerónimo Martins. This partnership, which has been growing both in trust and sales in the last decade, illustrates how the Group incorporates such ethical, social and environmental concerns in its supply chains, while ensuring the quality and competitiveness of its offer.

“AQUACULTURE IS CLEARLY THE MOST SUSTAINABLE ALTERNATIVE TO FISH SUPPLY.”



Sea bream began to be produced in September 2017 in this unit set up in Madeira.

ANTÓNIO SERRANO



CEO OF JERÓNIMO MARTINS AGRO-ALIMENTAR

Underneath the sumptuous white icy tip of an iceberg, there is a deep hidden layer, there to show that problems might not be as simple as they seem. As we still picture oceans as an infinite and endless resource, more and more fish species are on the verge of disappearing, while the world's population keeps on growing, reaching 9 billion people by 2050. So, what's the catch? With fish accounting for 20% of the average *per capita* animal protein intake worldwide, António Serrano, CEO of the Jerónimo Martins Agri-Business area, claims that aquaculture is the most sustainable alternative to traditional fish supply and one of the best ways of surpassing a massive global feeding challenge.

AQUACULTURE HAS BEEN AN INVESTMENT OF THE JERÓNIMO MARTINS GROUP FOR SOME TIME NOW. HAS THE PROJECT REACHED ITS FULL EXTENT OR IS THERE STILL ROOM TO GROW?

The project is still in its initial stages and has a lot of room to grow. We only started aquaculture in 2016. Our challenge is to continue growing with the current species, sea bass and sea bream, and to develop other species. We have only just started, so there is a long road ahead.

AT WHAT STAGES ARE THE INVESTMENTS IN MOROCCO AND SPAIN?

In Spain we developed a partnership with a well-established company to produce sea bass and sea bream in the area of Alicante. As of September this year, we will have the first sea bass and sea bream produced there. We estimate a total of 400 tonnes by the end of the year.

In Morocco we are finalizing the agreement with a company and the plan is to start installing sea infrastructure in September.

THE GROUP HAS ALWAYS EMPHASISED THE NEED TO PROTECT ITS SUPPLY CHAIN. WHY?

This need basically results from the food demand all over the world linked to population growth. FAO estimates that the world population will reach 9 billion people by 2050, which will require an increase in food production by approximately 60% compared to the current situation. On the other hand, and no less important, is the growing concern of Food Security, which requires a tighter control of the production chain of the critical produce required for the Group's Distribution sector.

SEA BASS AND SEA BREAM ARE TWO SPECIES THAT HAVE PROVEN THEIR WORTH. IS IT POSSIBLE FOR THE GROUP TO MOVE ON TO PRODUCING OTHER SPECIES?

Yes, that is our goal. We now have an R&D project to produce salmon in Portugal or in any other location where this is possible, because salmon is a very important species for the Group.

THERE IS A CONTINUING DISCUSSION ON FISHING QUOTAS. IS AQUACULTURE A SUSTAINABLE ALTERNATIVE?

Aquaculture is clearly the most sustainable alternative to fish supply. Right now, many wild fish stocks are overexploited and have reached very critical levels. It is only by moving from an extractive industry (fishing) to a productive industry such as aquaculture that we will manage to attain a balance between wild stock management and pressure of consumption. This transition was made thousands of years ago when our ancestors developed agriculture and livestock.

WHY DOES THE GROUP HAVE OPEN SEA FARMS INSTEAD OF AQUACULTURE IN TANKS?

The decision to have open sea cage aquaculture has to do with the fact that this is the most efficient way to produce aquaculture fish, especially considering the volumes we aim to achieve. The fish is produced in its natural habitat, in large cages where they can swim freely.



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WHAT IS YOUR VIEW ON THE HARSH CRITICISMS AGAINST AQUACULTURE BECAUSE THE ANIMALS ARE FED WITH FISHMEAL AND RATIONS?

The public in general is very much unaware of what happens in this area. The reality is that the main food of the fish is fish, that is their natural food. So, it is only natural that the rations for fish produced for aquaculture contain fishmeal. These may include fish captured exclusively to produce the fishmeal, as is the case with the anchovy or the capelin, or in other cases fishmeal produced from waste from the fish processing industry, such as tinned fish or frozen fillets. In this case, it represents a well-integrated use within a circular economy approach in which waste is transformed into high-value protein to feed fish.

ARE THERE SIGNIFICANT DIFFERENCES BETWEEN THE QUALITY OF AQUACULTURE FISH AND THE FISH CAUGHT IN ITS NATURAL HABITAT?

In our case, aquaculture and wild fish are caught in just about the same way. The issue here at stake is how different they are in terms of quality. What we can safely say is that there is no substantial difference in quality. In fact, we even find that aquaculture fish can reach higher quality levels, depending on the degree of freshness, as its capture is programmed according to market needs and therefore may reach the market faster.

We keep control over the composition of the feed consumed by aquaculture fish and therefore are able to avoid the presence of contaminants such as heavy metals, or microplastics. With wild fish this remains a mystery.

WHAT ABOUT FLAVOUR?

Flavour depends on each person's preference, but some blind tasting was already carried out and people could not identify whether it was wild fish or aquaculture fish. Currently, because of its availability, a large part of the sea bass and sea bream consumed in Portugal (90%) originates from aquaculture and has already become part of Portuguese consumer habits. Salmon is another example, with approximately 99% coming from aquaculture! The curious thing is that there is probably still a large number of consumers who eat aquaculture fish thinking they are consuming wild fish. And they are very pleased with its quality.

HIDDEN WONDERS

*When Mother Nature, History and Gastronomy
meet underneath the ground, the result is
a unique flavour, seasoned with the taste of
generations. As deep as a secret.*

CRYPTIC DELICACY



After cooking slowly for six hours, simmering gently in its natural steam bath, the cozido is dug up from the ground and makes its way to the table.

FURNAS STEW

Dramatic. Awe-inspiring. Mysterious. Volcanoes hold an inexplicable attraction for people. Few phenomena rival the fascination and respect inspired by their savage beauty. And their power, whether dormant or active. They produce the planet's most fertile soils. Their inner heat embraces the rivers around them like lava. And postcard-ready cities grow up around them. This was also the origin of one of the world's largest springs, in Vale das Furnas. On 3 September 1630, one of the most violent volcanic eruptions ever known in the Azores shook the island of São Miguel. The modern town of Furnas did not yet exist.

Thanks to the natural wonder of volcanic heat, the Furnas stew is becoming one of the most distinctive flavours of the Portuguese gastronomy.

The only inhabitants in the area were a number of priests and shepherds. Contemporary reports, quoted by the local historian Manuel Luís Maldonado (Angra do Heroísmo, 8 September 1644 – Angra do Heroísmo, 24 October 1711) in his work “Fenix Angrense”, speak of a rumbling so loud that it was heard on the island of Terceira (some 200 kilometres distant), where the population imagined they were hearing “a battle between two mighty armadas”. On the fourth day, the cloud of ash covered the whole sky, bringing such darkness “that without their torches and tapers, people in the street were unable to recognise each other”.

The volcano has been dormant since then, and its crater formed what is now the wonder of the region, the Furnas Lagoon. And, on the banks of the lagoon, one of the most distinctive flavours of Portuguese gastronomy, cooked in the natural heat of the Earth: Cozido das Caldeiras, popularly known as Cozido das Furnas. By burying the pot in a natural oven dug in the volcanic soil (known as the “fumarola”), this dish is a variant of the traditional Portuguese “cozido” (stew), the origins of which date back to the seventeenth century. Apart from the yams, a highly nutritious tuber (rich in carbohydrates, vitamins and mineral salts), the ingredients used to prepare this speciality are the same as elsewhere: meat, “enchidos” (chorizo and blood sausages), potato, carrots and green vegetables – although each cook has his own preference. What makes it so special is how it is cooked. At a temperature of close to 100 degrees, the pot works its slow magic in the steam released by the boiling volcanic spring. The ingredients are placed in a strict order. From the bottom up: beef, pork and chicken. Then, cabbage (two varieties), potatoes, sweet potatoes and carrots. And then, the island's own chorizo and blood sausage. The top layer is then covered with cabbage leaves to hold in the heat and moisture. The only seasonings are salt and pepper. When prepared, the pot is lowered into a hole, suspended by a string and wrapped in cloths, to stop the sulphur from spoiling the flavours. Finally, the hole is covered with a lid and refilled with earth.



Lake of Furnas, São Miguel Island, Azores. The steam from the openings in the volcanic soil that surrounds the lake cooks the traditional stew.

A “FEAST FOR THE LUCKY FEW”

The cozido cooks slowly for six hours, simmering gently in its natural steam bath, and is then dug up again from the ground as a “feast for the lucky few”. These were the words used to describe it by the island's great poet, Natália Correia (Fajã de Baixo, São Miguel, 13 September 1923 — Lisbon, 16 March 1993), on a visit to Parque de Terra Nostra with her fellow writer and journalist Fernando Dacosta. “Today you will come with me to one of the few places inhabited by gods. Only initiates are worthy of sharing it,” she told him, before their visit to the stunning botanical gardens.



The ingredients used to prepare this specialty are mostly meat, chorizo and other blood sausages, potatoes, yams, carrots and green vegetables.

WINE OF THE DEAD:
A RELIC FROM
THE NAPOLEON WARS

Despite what its name suggests, this is not a wine from the beyond, or under a curse. And if the name is unusual, the story of its origins is even stranger. The fault, or virtue, of its discovery belongs to Napoleon Bonaparte, during the second of the three French invasions of the Iberian Peninsula (1807-1811). The Wine of the Dead, said to cheer the living, has lived to tell the story of a wise people, fierce in defence of their heritage. In the face of the advancing armies commanded by General Soult, who looted, pillaged and destroyed everything in their course, the people decided to hide what they valued most. The local people had the idea of burying their bottles in the ground, beneath the vines, their cellars and wine presses. This became a common practice, especially in the region, where vines had been cultivated and wine produced for many centuries.

When the invading armies had been definitively repulsed, the inhabitants were able to retrieve their treasure. When they dug up the wine, they had a pleasant surprise: not only had it not spoiled, but its quality had improved. Because it had fermented in the dark and at a constant temperature, the wine was well-rounded, had the colour of straw and held an alcohol content of 10 to 11%, becoming naturally sparkling. This accidentally discovered technique gave rise to the tradition, preserved over generations, of burying the wine for at least a year. Hence the name, Vinho dos Mortos, the Wine of the Dead.

Seven thousand bottles of the Wine of the Dead are buried in the cellar every February for sale later in the summer.



© Miguel Riopa/AP/ Getty Images

In mid-November, work starts on planting new vines on the western slopes of Boticas, Portugal. In February, the vines are pruned, fertilised and tended. Two months later, the careful work of grafting ensures that the vines burst into leaf with the warmth of spring. The next phase is regular spraying with sulphur and sulphates, which continues until the first week of August. And then at last comes the high point of the year, the grape harvest, in the first week of October. This is traditionally a festive moment, when the grapes are picked for the year's wine. The varieties used are Alvarelho and Malvasia Fina (white), Bastardo, Tinta Carvalha and Tinta Coimbra (red). The grapes are then carried to the wine press where they are trodden. From there the wine is transferred to barrels, where it continues to ferment. Once the wine reaches the malolactic stage, it is time for certification, and then bottling. Next June, the wait is over: the time has come to taste last year's vintage. In the whole municipal district, there is only one official producer of this light-bodied, sharply characteristic wine: Armindo de Sousa Pereira, who has kept alive the skills he learned from his parents and grandparents, producing no more than around seven thousand bottles each year.

Winegrower Armindo Sousa Pereira digs up bottles of the Wine of the Dead in his cellar. He is the only producer officially registered to commercialize it.



© Miguel Riopa/AP/ Getty Images

ŽUR AND HERRING FUNERAL

In times gone by, Žurek or (Žur), a rye flour soup, served with white sausage and boiled eggs cut into halves, was the Lenten staple. When Good Friday finally came around, or the following morning, the populace, weary of their unvarying diet, gave it a pagan burial, complete with songs and poetry. The soup pot was buried or its contents poured out. And the Herring fish was hung out on a tree.

Today Žurek is one of the main dishes on the Easter table. Although the name Žur comes from the German adjective “sauer” - which means sour, stung and acidified - it is considered a specialty of the Polish, Belarusian and Ukrainian cuisines.

Rye leaven needs about 5 days for optimal fermentation to ensure this soup's distinctive flavour. Water, garlic, bay leaves and allspice are added to a few tablespoons of rye flour to create this delicate soup base. Then, all kinds of varieties arise from different flavour combinations. Rye can be boiled either on a vegetable stock or on a meat stock, with sausages and other smoked meats. In Cracow, the delicacy is often cooked on a mushroom broth.

BIGOS

It's no coincidence that “bigos” means “mess” or “problem” in Polish: there is no standard recipe for this Polish hunter's stew of the winter months. Leftover pork, wild meats and sausages, mushrooms, cabbage, onion and garlic are some of the most common ingredients. Seasoned with pepper, bay and caraway seeds, it is left to rest, often underground, for several days, to draw out its full flavours.

With several hundred years of tradition, this one-pot dish is one of those recipes that changes from home to home, regardless of the region or season. Adding of a splash of dry red wine greatly increases its distinctive taste. It is also said that its flavour depth gets even stronger when Bigos is reheated, after being strongly cooled, or even thawed. It can be served as a hot appetizer or a snack.

This Polish stew consists of leftover pork, wild meats and sausages, mushrooms, cabbage, onion and garlic.



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© Dariusz Dzimik / Getty Images

Žurek is a rye flour soup, served with white sausage and boiled eggs cut into halves.

Bigos is left to rest,
often underground,
for several days, to draw
out its full flavours.

SAVING THE AMAZON THROUGH MY KITCHEN



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The menus are prepared with various exotic ingredients, ranging from ants to creole saffron.

THE Colombian Amazon amounts for over 42% of the national territory and, unlike the case of the Brazilian or Peruvian ones, it is both well-preserved but also quite unknown in its own country. This may be mainly due to the armed conflict that for decades took place in the south of Colombia. As a consequence of the general lack of knowledge, my culinary and cultural project has been more complicated, as one can hardly understand and appreciate what one doesn't know. Five years ago I took the challenge and started with a gastronomic project called La Chagra, located in Medellin, in honor of the sacred polyculture system of the indigenous communities, as an attempt to bring together the Amazon and the rest of the country.

JUAN SANTIAGO GALLEGO



CHEF AND OWNER OF LA CHAGRA RESTAURANT. GRADUATED CHEF FROM THE GASTRONOMIC SCHOOL OF ANTIOQUIA (ESGANT) AND A LOVER OF THE AMAZONIAN RAINFOREST.

La Chagra saw the light in August, 2014, with very limited resources, and step by step, with lots of effort and passion, it has evolved into a well-established concept of tasting menus which are designed to make our guests aware of the importance of the Amazonian biome and to promote the respect for its guardians, the indigenous peoples. The success of these menus is the result of a deep and close collaborative work with the indigenous communities, which besides being our masters have become our main suppliers of fruits, vegetables, tubers, flours and oils. Imagine the luck of being able to cook with ingredients like various types of ants and larvae, asái, aguaje, purple corn, sweet chili pepper, malagueta chilli pepper, coca leaf, vegetable salt, tobacco leaf, uña de gato, (literally cat's claw, a very unusual plant), creole saffron or Amazonian beans. However, the most important ingredient we have is indigenous wisdom. Their universe is quite rich and complex and even now, still mysterious for expert anthropologists. All logistical procedures must be executed by the book, in order to be able to fulfill the demand of our restaurant and other clients. Even more so given the fact that we have to consider the natural cycles of abundance - which in some cases last for just one month - and the environmentally-friendly techniques of harvesting used by the indigenous peoples, loyal to Mother Earth's will. La Chagra intends to integrate with the more than 50 indigenous peoples in Colombia, paying close attention to their habits, beliefs, cosmogonies and particularly their approaches to food, as they perceive it as sacred and try to follow the will of their gods with every product Earth produces. La Chagra, as a dynamic and always-in-construction project, intends to make a culture visible through the most important activity of everyday life: eating.

The restaurant intends to make its guests aware of the importance of the Amazonian biome and to promote the respect for the indigenous peoples.



© David Curtis / Getty Images

The project is a culinary trip through the Amazon, where each course tells a different story.

DNA TESTING AGAINST FOOD FRAUD

PIG IN A POKE

DNA food tests are giving companies more reliable tools to expose and fight fraud scandals. For food producers and retailers, it means going as deep as can be.

ECONOMICALLY

motivated fraud and adulteration of food and beverage products go back millennia, with Roman philosopher and writer Pliny the Elder complaining about premium wines blended with inferior grapes in the first century A.D.

Holding this shameless behaviour was the idea of saving costs, cutting corners, or deluding those who bought hardly crafted adulterated food, mixed with some of its low-quality relatives.

Despite the ancient practices, it was only in 2013 that the contemporary world really woke up for this issue. A horse meat scandal hit hard on the news. In Ireland, specialised food inspectors found out that beef meat sold at common supermarkets contained considerable traces of horse meat. From there, over 15,000 tests were carried out across the European Union, unveiling worrying results: over 300 turned out to contain horse meat DNA.

What does food fraud mean anyway? In short, it happens every time food is not what it is purported to be. Generally speaking, food fraud is understood to be the deliberate marketing of foods with the intention of making an economic or financial gain by deceiving consumers. This is achieved on the one hand by means of unauthorised adulterants which alter the composition of the food and, on the other, by consciously false declarations, such as the deliberate use of erroneous data or omission of correct information on the label.

Meat tops the list of food fraud cases because it is expensive to produce and buy, it is widely consumed and adulteration with cheaper substitutes is hard to detect for the average consumer. There are, however, other perfect candidates (as shown below). And this is not just limited to human foods. Studies show that up to 40% of pet food is either mislabelled or contains ingredients not listed on the package. What this really means is that food fraud is a problem across every grocery aisle, from the seafood counter to the butcher's display – and in every aspect of the food supply chain.



© Dan Fernal / Getty Images

FISH AND SEAFOOD

Fish and seafood swaps is a global practice. The typical example is catfish, which is mislabelled and sold as eighteen different – and more expensive – types of fish.



© Yamada Taro / Getty Images

HONEY

It started to be adulterated in the 70s, when high-fructose corn syrup first appeared on the market and proved to be a cheaper fraudulent substitute. Still in 2016, 14.2% of honey was likely to be adulterated, according to an EU report.



© Brian Hagiwara / Getty Images

EXTRA VIRGIN OLIVE OIL

Often blended and diluted with cheaper lower-quality seed oils such as soybean or sunflower oil, or non-extra virgin olive oil, this is a big business for organised crime.



© Robt Lawson / Getty Images

PARMESAN

Adulteration is far from being the only type of food fraud. Another common category is straightforward counterfeiting, which happens when a food product with a specific origin and/or processing method is substituted with similar, cheaper, lower-quality ingredients. A common case would be mixed grated cheese sold as Parmesan.

Because retailers and food producers have a duty to promote quality and to protect consumers, Jerónimo Martins' companies carry out several non-mandatory DNA tests

SHEDDING A NEW LIGHT ON FOOD FRAUD

Gas chromatography, mass spectrometry and whole genome sequencing are big deep technical words that represent some of the most sophisticated technologies and tools available these days for detecting food incongruities. They can, however, become too expensive and time consuming.

To curb this situation, retailers and food labs are investing in simple, inexpensive and easily administered tests to confirm that raw materials and ingredients are what they are purported to be. By collecting small samples of food and analysing the DNA it contains, and comparing the results to several samples of known authentic species identified in a library of genetic data, companies can quickly determine if a real meat or seafood product, for example, has been wholly substituted or adulterated with another kind of animal protein.

At the same time, this kind of tests allow us to detect specific food allergens and the presence of genetically modified organisms on products. To detect food fraud and substitution, other fingerprinting analytical techniques are used for a deeper understanding on what's in that cheesy piece of goat cheese. Fortunately, the majority of food fraud cases don't turn into significant food safety incidents for consumers' health. Whenever there's a breach in the food supply chain controls, anything may come through. Even when food fraudsters have no intention of harming people's health, the circumstances in which those crimes are committed don't always allow for them to make the right moves and fix this issue on time.

Retailers and food producers - as part of the supply chain - have a duty to promote quality and to protect consumers from adulterated food that, in the best case scenario, can simply not be what they have paid for.

RETAILERS: AN EAGLE EYE APPROACH

As food markets become increasingly global, the main challenge for retailers is to ensure a strict control of ingredients and formulas throughout the supply chain.

That is why the Jerónimo Martins' companies operating in Portugal, Poland and Colombia carry out several non-mandatory DNA tests to all products that refer to species, all products of animal or vegetable origin resulting from mixtures, as well as to all products with potentially GMO ingredients.

Carlos Santos, Quality and Private Brand Development Director of the Jerónimo Martins Group, explains that the "authenticity of ingredients must be preserved, to better control the origin of products and prevent food frauds".

Document traceability can help, but, as a matter of fact, "does not detect situations of abnormality such as cross-contamination or fraud." Being able to scan the entire DNA content of a food item means it will be difficult to substitute or hide an ingredient without it being detected.

As each species has unique DNA sequences, "our companies identify these unique sequences and compare them to a database with millions of data allowing the identification of all species present in the product, thus characterizing the authenticity of food products", Carlos states.

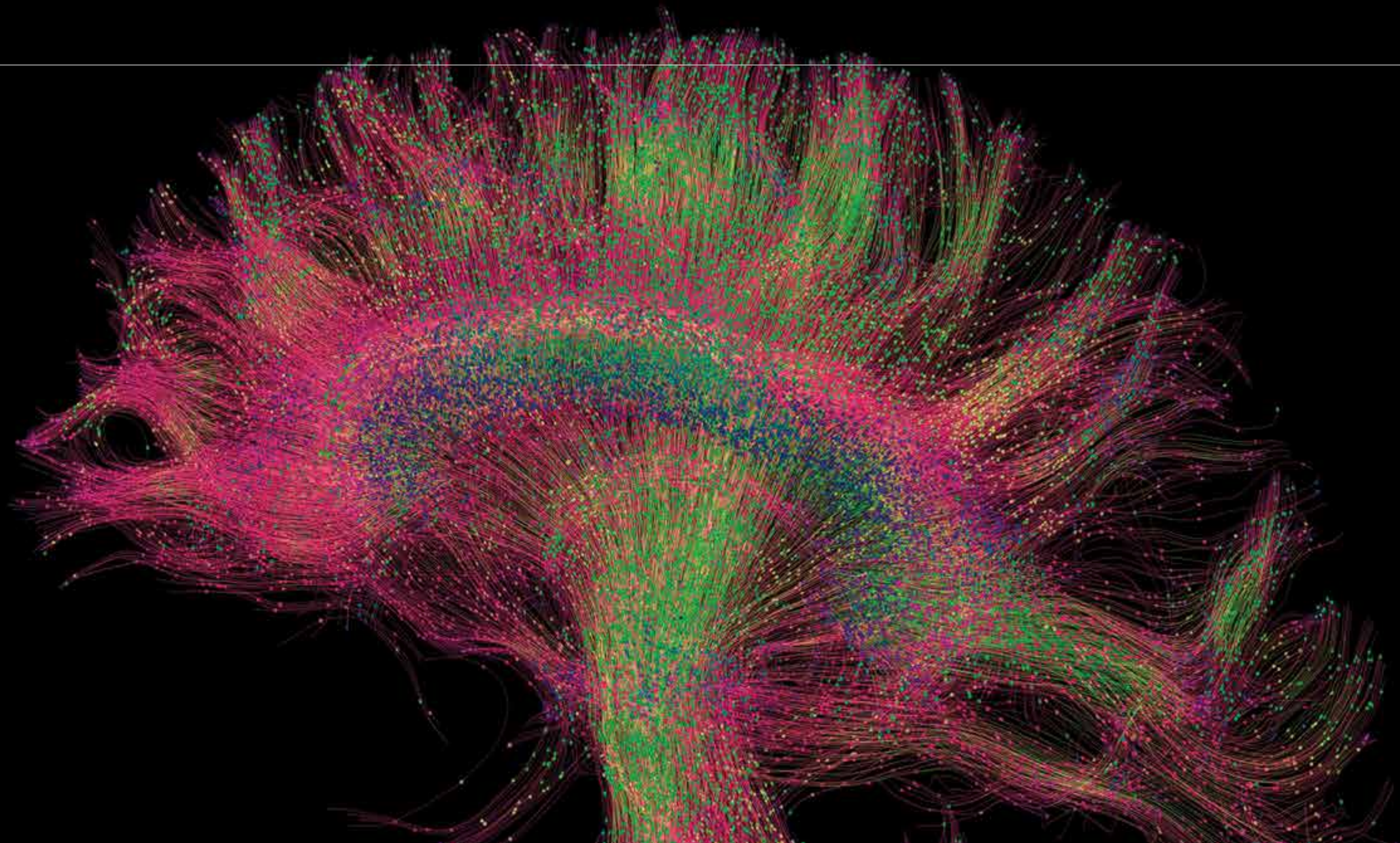


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This label assures the quality control of a given species, in this particular case, the Atlantic Cod (Gadus Morhua).

Apart from the DNA testing, the Jerónimo Martins Group also invests in the food safety area for the sustainable development of its Private Brand Product range. Pingo Doce's product formulas exclude over 60 additives and substances - allowed by law - that give colour, flavour and texture to the products, making them visually more appetizing.

"The Group is constantly following the newest scientific studies that analyse the impact of certain additives, such as artificial colouring, preservatives, sweeteners, hydrogenated fats, flavour enhancers, gelling agents and emulsifiers on health. That way, we can better analyse our formulas and act fast."



DEEP LEARNING

Artificial Intelligence, the brain of the machine of the future, is already influencing and will continue to revolutionize all areas of human life, with machine learning becoming an integral part of our daily lives.

MEN THAT BECOME MACHINES, MACHINES THAT BECOME MEN



Directed by Ridley Scott, Blade Runner (1982) depicts a future in which synthetic humans known as replicants are bioengineered by a powerful corporation to work on off-world colonies.

‘K’, a replicant android, crosses in and pours two drinks as he sits on a chair in the middle of the living room. Neighbours at the window, a couple, on the other side of the street. Ordinary life. Joi, a digital companion projected from a hard line console unit, holds a plate of steak and fries. Not real, of course. An illusion of satisfaction. Just like Joi in her apron. ‘K’, the android, wants more. He wants to feel. ‘K’ wants to be human. Can this scene taken from the latest Blade Runner film be our predictive future? Is reality surpassing fiction or are artificial humans a cliché for such a long time now that, when they arrive, they will seem to some a disappointment? Imagination, faster than history, faster than technological advance, had already rehearsed this future in books, films, TV dramas: artificial intelligence, machine learning, big data, algorithms. These terms became part of the everyday public discussion, often appearing in today’s political, economic, social and philosophical arenas. But although artificial intelligence and the exponential pace of new technological advances are increasingly imposing themselves on our reality, this phenomenon is not correspondingly reflected in the public sphere, namely the discussion of its implications and limits. From consumer behaviour to the job market, from biology to medicine and ethics, technological evolution is part of our daily lives, and even seems to be reaching areas – as is the case of artistic expression – that were, so far, confined to the depths of the human soul.

One of the emerging hot topics in machine learning and AI is the issue of deep learning, part of a broader family of neural network methods based on artificial neural networks. Machines are now taking over complex jobs we previously thought only humans could do and, due to powerful algorithms, some became capable of performing tasks without human assistance. Their system is not pre-programmed: they learn from experience. The aim is to have the system mimic the human brain and learn to improve itself over time to eventually become better, using reinforcement learning. The holy grail of artificial intelligence is a machine that can teach itself.

Deep learning machines are currently been applied to fields including computer vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation, bioinformatics, drug design, medical image analysis and board game programs, where they have produced results comparable to and in some cases superior to human experts.



WILL CREATIVITY BE AN EXCLUSIVELY HUMAN ATTRIBUTE?

Deep artificial neural networks were originally inspired by information processing and communication nodes in biological nervous systems but yet have various differences from the structural and functional properties of biological brains, especially human brains, which make them incompatible with neuroscience evidences. Specifically, neural networks tend to be static and symbolic, while the human brain is dynamic and analogue.

But before we can achieve that (an artificial neural network that works like a human brain), we need better machine learning algorithms – a Master Algorithm – an algorithm that can learn anything from data, and to do that, we need a deeper understanding of how learning works in our own brains. The development of artificial intelligence has made it possible to replicate the complexity of brain organization and its information processing in artificial systems. There are multiple approaches. One of them is to reverse engineer the brain. Another is to mimic evolution. We need to combine ideas from these two paradigms to come up with a master algorithm, something like a grand unified theory of machine learning, like the grand unified theory of physics. The challenge is to formalize intelligence not only to implement it into machines, but also to understand the human brain. Attempting to distil intelligence into an algorithmic construction may prove to be the best path to understanding some of the enduring mysteries of our minds.

POSSIBILITIES, IMPLICATIONS, LIMITS

There are all kinds of aspects involved in the use and development of artificial intelligence, the current applications of AI reflecting upon its social implications in a whole range of different areas, including implications of a biological, legal, social, ethical and philosophical nature. Some of these questions must be examined in depth: is it possible to include responsibility as one of the functions of artificial intelligence machines? Are algorithms capable of exercising justice or moral judgements? What jurisdiction is applied to autonomous agents? What are the implications in the field of ethics and in protecting the privacy of data and personal information?

JUST BECAUSE WE CAN, IT DOESN'T MEAN WE SHOULD

To escape our mortality, we will devise an improved version of ourselves: we’ll be imitated and bettered. Futurist Gerd Leonhard advocates that before it’s too late we should stop and ask: how to adapt technology without becoming technology ourselves? What moral values are we prepared to defend before the human being loses its meaning forever?

“I believe we need to step back from an expert-led debate about what’s possible and how to achieve it. Instead, I think we must start with a more fundamental exploration of what role we want these transformative technologies to play in serving humanity: just because we can, it doesn’t mean we should. In the very near future, it will no longer be about whether technology can do something (the answer will almost always be yes) but whether it should do something – and why”, says Leonhard.

TRANSHUMANISM OR THE RISE OF ROBOTS

Artificial intelligence is changing the way in which human beings work, live and interact with one another. What will it be like in the future? Are we thinking of ways to promote a hybrid future, a beneficial social relationship between machines and humans, beyond their more obvious utilitarian dimension? What will be the potential development of technologies seeking to reproduce human intelligence, their possible role in the future expansion of humankind to other solar systems, as well as possible scenarios that might lead to two extremes: ranging from the expansion of human intelligence to the extinction of the human race.

Ultimately, if we leave it to machines - the decision-making process and all the thinking - can the human being gradually lose, in its evolutionary process as a species, the ability to think, or at least, the ability to make decisions? We may become completely useless without technology – slow, incomplete, dumb and lazy. Will we gradually forget our humanity and become ever more mechanistic just to remain relevant? As computing becomes mobile, then wearable, ingestible and implantable, will our distinct planetary advantage as a species be sacrificed for a digital hit?

And can machines gain such a level of consciousness – of self and of the other, of time and of space, of good and of evil - that they will aspire to be like Men, that they will aspire to dominate him or to replace us as the prevailing “species” on the planet? [Blade Runner (1982)]: The camera closes on Roy, replicant android, for his final, poetic, self-conscious soliloquy: “I’ve seen things you people wouldn’t believe. Attack ships on fire off the shoulder of Orion. I watched C-beams glitter in the dark near the Tannhäuser Gate. All those moments will be lost in time, like... tears in rain.”

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1637

DESCARTES' PREDICTION

In the "Discourse of Method", the French philosopher, physicist and mathematician was the first to reflect on the possibility of using engineering to mimic the appearance of any living being and, in animals, behaviour as well. With humans, René Descartes concludes that it would be morally impossible to replicate observable abilities by manipulating matter, as they are unique to the human soul.



© Image / Getty Images

1921

The word "robot" was first heard in science fiction play R.U.R. (Rossum's Universal Robots), by Czech writer Karel Capek. The term "robot" is derived from the Czech word "robota", which means 'forced labour'.

THE ORIGIN OF THE ROBOT

1929

THE FIRST HUMANOID

Capable of moving its head and hands and of slightly changing its facial expressions via an air pressure mechanism, "Gakutensoku" was built in Japan. It was designed by Makoto Nishimura.



© John Sander / Getty Images

FOLLOWING AI BREADCRUMBS

Despite Artificial Intelligence being the driving force behind the most significant technology advancements in recent years, the theory and fundamentals of computer science that inspired the most unusual inventions have been around for quite some time. These are the significant milestones that have led to the development of the artificial neural networks that are at the heart of deep learning.

1944

THE FIRST COMPUTER

Professor Howard Aiken, from Harvard University in Cambridge, built the MARK I, the first computer designed to be used in navigation to calculate tables, with financing from IBM and the United States Navy. It was completely electromechanical, 17 metres long and 2.5 metres tall, weighed nearly 5 tonnes. It could do extensive calculations, without human intervention.



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1951

THE NEUROCOMPUTER

Marvin Minsky and Dean Edmonds used three thousand vacuum tubes to build the first 40 neuron artificial neural network. The SNARC (Stochastic Neural Analog Reinforcement Calculator) neurocomputer simulated a rat finding its way through a maze.

1960

TALKING TO COMPUTERS



© ullstein bild / Getty Images

Alexa and Siri's predecessor was called ELIZA and it was developed by Professor Joseph Weizenbaum in the Artificial Intelligence Laboratory of the Massachusetts Institute of Technology (MIT). This computerised psychotherapist held conversations with users through text and was the stepping stone to implementation of natural language processing.



© George Kahar / Getty Images

1968

"2001: SPACE ODISSEY"

The collaboration between Stanley Kubrick and Arthur C. Clarke gave birth to a sci-fi epic that would become a cinematic landmark. In this film, HAL 9000, a superior form of sentient computer, embarks aboard the Discovery space shuttle on a mission to Jupiter, along with a human crew.

1991

CONNECTING THE WORLD

Worldwide Web connected the world. The development of the first online website and publication of the hypertext transfer protocol (HTTP) - that today enables the connection, creation and sharing of information that feeds AI - was left to Tim Berners-Lee, a British researcher from the European Organization for Nuclear Research (CERN).



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1997

MACHINE BEATS MAN

Deep Blue, a supercomputer designed by IBM, made history by beating world chess champion (between 1985 and 2000) Garry Kasparov, on May 11, in a six-game chess match.



© Ted Thai / Getty Images

2018

THE AUTOMOTIVE REVOLUTION

Having started as a research project within Google in 2009, Waymo launched the first autonomous ride service in Phoenix, Arizona, signaling the revolution. Ten years was also how long Transition, the first flying car, had to wait to get off the ground. Developed by Terrafugia, the vehicle can travel autonomously for 600km and at up to 160km/h. At this early stage, pre-sales are limited to the United States.



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2015

SOPHIA IS BORN

Sophia was created by American engineer David Hanson, of Hanson Robotics, and designed to look like Audrey Hepburn. She can emulate 62 facial expressions and she is capable of acquiring new knowledge: the more she interacts with humans, the smarter she gets. Sophia needs a cloud-based Wi-Fi connection (MindCloud) to operate. She was the first humanoid robot to be featured on the cover of a fashion magazine, Elle Brazil.



© Anton Gvozdilov / Shutterstock.com

DEEP LEARNING, ARTIFICIAL GENERAL INTELLIGENCE AND WHOLE BRAIN EMULATION



Portrait of Edmond Belamy, 2018, created by GAN (Generative Adversarial Network). Sold for \$432,500 on 25 October at Christie's in New York.

© TIMOTHY A. CLARY / Getty Images

ARLINDO OLIVEIRA



PROFESSOR OF THE DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING OF INSTITUTO SUPERIOR TÉCNICO (IST), ARLINDO OLIVEIRA IS ALSO PRESIDENT OF IST AND MEMBER OF ITS EXECUTIVE BOARD.

THE field of Artificial Intelligence (AI) has been the subject of intense research for more than six decades but has, so far, failed to reach its main objective, that of creating machines that are as intelligent, as flexible and as creative as human beings. Despite the many optimistic predictions that have been made in the course of these decades, this goal of designing machines (or programs) that exhibit artificial general intelligence (AGI) remains as elusive today as it was in 1958 when the New York Times published a story that started, in an overly optimistic way, with the sentence “The Navy revealed the embryo of an electronic computer today that it expects will be able to walk, talk, see, write, reproduce itself and be conscious of its existence.”

In part, this is due to what is known as Moravec’s paradox: high-level symbolic reasoning, which seems hard to us, is relatively easy to program and requires very few computational resources, but low-level perceptual processing, which seems easy, is hard to program and requires extensive computation. For instance, is it easy to write a program that demonstrates mathematical theorems but it is hard to write a program that identifies the objects in an image.

Deep learning models can become proficient at many different tasks but can’t learn like humans

The difficulties underlying this paradox made it very difficult to create systems that deal with the uncertainties of the real world and imposed serious limits on the type of systems that AI researchers have been able to create. As the decades went by, researchers and developers realized that programming the detailed behaviors required to handle real-world data is a near-impossible task, leading to several AI winters, periods when the field seemed to stagnate and the objective of developing AGI seemed unattainable.

One area of AI that has gained increased relevance is machine learning, the field that is concerned with making machines learn from experience, just as humans do. Neural networks, a machine learning approach that is based on the use of perceptrons, simple units inspired in biological neurons configured to perform specific tasks, increased in popularity as time went by (they were already the topic of the aforementioned NY Times piece) but, in the 20th century, remained unable to address complex perceptual problems. In this last decade, however, with the development of more powerful computers, extensive datasets, and new methods collectively known as deep learning, neural networks finally started to be applicable to real-world problems. Deep neural networks, trained using mathematical algorithms that maximize their performance on a given task, have demonstrated exceptional performance in a number of tasks that, until now, could not be handled by AI systems. These tasks include face or object recognition in images and videos, automatic surveillance, superhuman-level playing of board games, automatic machine translation, autonomous driving of vehicles, synthesis of realistic images and videos, analysis of legal contracts, image based checkout and billing in stores, voice-activated execution of orders by digital assistants, and medical image analysis, among many others.

Despite all these successes, we still lack a clear roadmap to AGI. Deep learning models can become proficient at many different tasks but they learn in ways that are very different from the way humans learn. Unlike humans, deep learning systems do not generalize well from small amounts of data and usually fail to translate knowledge acquired in one domain to another unrelated domain. Techniques like reinforcement learning (RL), long short-term memory (LSTM) and generative adversarial networks (GAN) extend significantly the range of applicability of deep neural networks, but it is unlikely that these and other existing techniques will be sufficient to bridge the gap that remains between today’s systems and systems that exhibit artificial general intelligence. The fact is that no one knows whether the continuous development of AI and machine learning techniques will eventually be enough to develop AGI or, on the contrary, whether AGI will forever remain an unreachable and unreasonable goal. Non-believers argue that the enthusiasm that characterizes the field today will be followed by another AI winter, as deep learning networks fail to fulfill the high expectations they have raised. Believers, on the other hand, argue that AGI is not only possible, but within close reach, requiring only incremental improvements in existing technologies. Of course, the truth may lie somewhere in between.

One thing, however, is indisputable. As our knowledge of AI and neuroscience advances, we will improve our understanding of the way intelligence results from the workings of the human brain and we will be able to better emulate similar processes in a computer. We know that AGI is possible, at least in principle, because evolution has created it once, in humans. If everything else fails, we may be able to simulate the detailed behavior of a brain in a computer, an approach that some believe is the easiest way to reach AGI. If this technology of whole brain emulation (WBE) becomes possible, the process will also lead to a kind of virtual immortality, a prospect that is unsettling, to say the least. It may happen that, for the first time in human history, immortality will not be a prerogative of the gods, but a possibility offered by technology. Whatever the future of AI, we may be sure the next decades will bring interesting new challenges.



CROSS-LAYER LEARNING

DANIEL VIEIRA



HEAD OF CUSTOMER INTELLIGENCE & ANALYTICS, JERÓNIMO MARTINS

KASIA enters the grocery store with a swipe, using her smartphone. She's a woman on a mission following a clearly defined shopping list: apples, avocado, bread, mozzarella cheese, soup and maybe that delicious ready-made quinoa salad. As she readily hand-picks the packages from the shelves to a raffia bag, Kasia resembles a maestro, fiercely conducting a perishables orchestra. Sounds familiar? This is a three-way symphony: entering the store, getting the products and exiting the premises. No money, no lines. Cashless and cashier-less. What once seemed to be a visionary essay about the future of retail is becoming a reality, driven by a new urban slash millennial slash 21st century customer, relentlessly seeking improved in-store experiences. Deep learning is one of the key technologies behind the current "AI (Artificial Intelligence) revolution", increasingly powering the interactions Kasia will experience when visiting her local store. Deep learning uses Neural Networks (NNs), which have been around for a while - going back to the 60's when Frank Rosenblatt introduced the Perceptron artificial neuron. Since then many advances in computational capabilities have made it possible to link up artificial neurons into many different layers, with each layer successively processing outputs from the previous layer and providing the inputs to downstream neurons, generating what we've come to know as Deep Neural Networks. Confused? For now just consider that a Deep Neural network is capable of processing the inputs fed into it, transform those in a way enabling it to learn how to carry out a certain task, provided enough data is available for it to be trained with a high degree of success. Given that deep learning in general is data hungry and that retail is data-rich - to the tune of circa 1.4 billion shopping baskets at our stores per year- we have a solid match, in that this technology enables us to tackle many of the challenges posed by new types of data being collected at scale across several dimensions of the store: transactional data, loyalty data, video and image data, amongst others.

One area that holds great promise is Computer Vision. If you think of Kasia picking the products to her raffia bag with no need to scan them, Computer Vision - powered by deep learning - is the technology that allows the trustworthy recognition of products and brands carried out of the store by Kasia. Amazon Go is a fairly well known example of a newer test format using this type of technology, and its promise of "frictionless shopping" is being made possible by the heavy use of advanced Computer Vision and Deep Learning algorithms. Furthermore, if we can train Deep Learning algorithms to recognize and identify products at scale based on images and/or footage, we can broaden out the use cases. One example that is getting attention is Out Of Stock (OOS) identification. With the right video infrastructure, we can start collecting regular data from our shelves, and train Deep Neural Networks to identify situations in which the product is missing from the shelf - a so called OOS. Many retailers are currently embarking on pilots with these technologies, often debuting with Computer Vision applications. One such example is the recently announced launch of Walmart's Intelligent Retail Lab (IRL) in New York. Although many of these applications are still in "pilot" mode, initial results certainly look promising. Therefore it's no surprise that many retailers are investing in greater machine learning (ML) and AI capabilities, both hardware (infrastructure), people and software (tools).

READY TO GO DEEPER?

What do we mean when we talk about "Learning"? This is the process through which a network learns how to carry out a specific task, for example recognizing a Stop Sign at an intersection in the case of a camera-equipped self-driving car or learning to recognize digits handwritten by different people. The latter is a commonly used task for benchmarking Deep learning approaches, using a widely known dataset - the MNIST dataset, as the so called "training" dataset. Training data typically refers to the data we feed a network so that it can learn how to carry out a specific task.



Example of a MNIST database of handwritten digits, commonly used in training and image processing systems.

Some examples of the MNIST dataset - a dataset that is often used as a benchmark for deep learning projects. This dataset contains 10 million different handwritten digits and their corresponding labels.

Armed with millions of examples of different observations (in the case of the MNIST dataset different digits handwritten by different people) and their corresponding labels - for example, that a certain handwritten digit actually corresponds to an "8", the deep learning network will learn how to classify digits that it hasn't "seen" before - i.e new handwritten digits - based on learning carried out with the originally labeled data.

Example of a learning task - recognizing handwritten digits (in this case, an "8") taking as input the pixel values of the image and providing as the output of the Neural Network a final class label.

The above example of image classification - teaching a Deep Neural Network to recognize handwritten digits - is an example of a Supervised Learning problem, and modern Deep Neural Network architectures excel at these types of problems provided enough data is available.

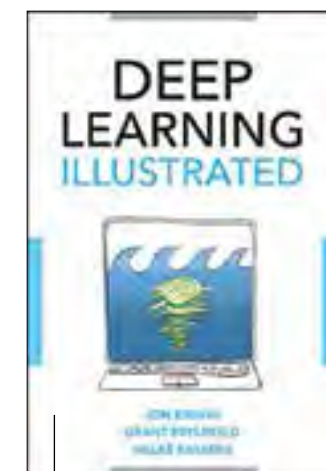
In the simplest case, the training process of a network yields a set of "weights", which are parameters that each individual neuron uses to either augment or diminish the signal it receives, before feeding the output of a simple calculation to downstream neurons. The final set of learned weights (in some cases, millions of parameters) provides us with what we call the final trained Deep Neural Network.

Despite not being able to cover the ins & outs of the training process in this article, the key point to note is that after such a training process is carried out our network of neurons will have learned the weights to apply to each input (such as pixels from an image) to carry out a specific task.

The fact that deep learning is so data hungry, often requiring millions of data points for successful training, is usually highlighted as one of its main weaknesses. After all, humans do not need to be hit millions of times by a car to learn that it's not a positive action.

Hence, a currently very active area of research is transfer learning - a technique in which models trained for a specific task are re-deployed on a second related, often adjacent task, in this way leveraging the past training already carried out, rather than having to start the process from scratch.

SUGGESTED READINGS



Deep Learning Illustrated: A Visual, Interactive Guide to Artificial Intelligence (2019)
A visual, intuitive, and accessible, and yet comprehensive introduction to the discipline's techniques and applications.



BRINY TREASURE

In 2015, Colombia found the San José galleon, putting an end to a 300-year mystery around the world's largest sunken treasure. But the resting place of this finding remains untold to protect the shipwreck and its submerged riches. The golden age of discovery suddenly dawns, again.



In 1708, the San José galleon sank in battle off the coast of Cartagena, Colombia.

THE SAN JOSÉ GALLEON MISTERY

LUIS GONZALO JARAMILLO



ASSOCIATE PROFESSOR AT THE
UNIVERSIDAD DE LOS ANDES.

THE remains of the San Jose galleon – the flagship of the fleet sailing between Panama and Cartagena de Indias to collect the Spanish Crown’s treasure before sailing back to Spain – rest very deep on the seabed of the Colombian Caribbean, nearly 600 meters deep , since June 8, 1708, after sinking in an attack made by a British fleet. In addition to roughly 600 people, including crew and passengers, this galleon carried millions of gold and silver and other things of economic value which, except for a few survivors, ended up at the bottom of the sea “as fast as praying the Creed” .

Even if historians have gathered reports stating that maybe the ship did not sink because of the British cannons but due to the explosion of one of its own cannons during the battle, this possibility remains one of the so many topics yet to be revealed by archeological research. This is also the case with the question about what the ship actually carried and the economic value of its cargo. The total amount of gold, silver, emeralds and eastern goods, including contraband, has been valued in American Dollars between 330 million and 17,000 million .

But where is the shipwreck exactly? Even if after December 4, 2015, the then President of the Republic, Juan Manuel Santos, announced that the shipwreck had been found by an international team using cutting-edge technology (a robot that helped take and disclose the first pictures of the wreckage), the exact location remains a state secret to date. However, this secret is being kept not only as a protection measure to prevent any potential plundering, but also because to this date and as in the famous Shakespeare soliloquy the question about whether to salvage it or not – and how to do it or who should do it – is now one of the challenges we face with this galleon as a society and international community.

Without seeing any lights on the horizon, the case of the San Jose galleon suggests topics as deep as the depths of the ocean where it lays: where to place the line between a collective benefit – Colombia and mankind, if seen as historical and cultural heritage –, and a private benefit – companies that have brought legal actions since the 1980s regarding this “treasure”, based on having or having reported the shipwreck coordinates, now coupled with the non-altruistic claims of the “Dream Team” hired by the government to find the shipwreck site location, and which is now a potential option for the salvage operations through a Public-Private Alliance? This is a controversial alliance because it includes the premise of the “repeated” – such as gold coins and ingots, which may not be declared as cultural heritage – which may be given partially as payment to the “originator”, but everything will be valued in Colombian Pesos, rather than as antiques, which is how such items will be traded. This makes this matter look as an orchestrated and clear scenario for a “legal” detrimental heritage action against the Colombian State itself. Legal because the also controversial Law 1675 of 2013, by which the way was paved to allow for the Public-Private Alliance procurement project, is still in force.

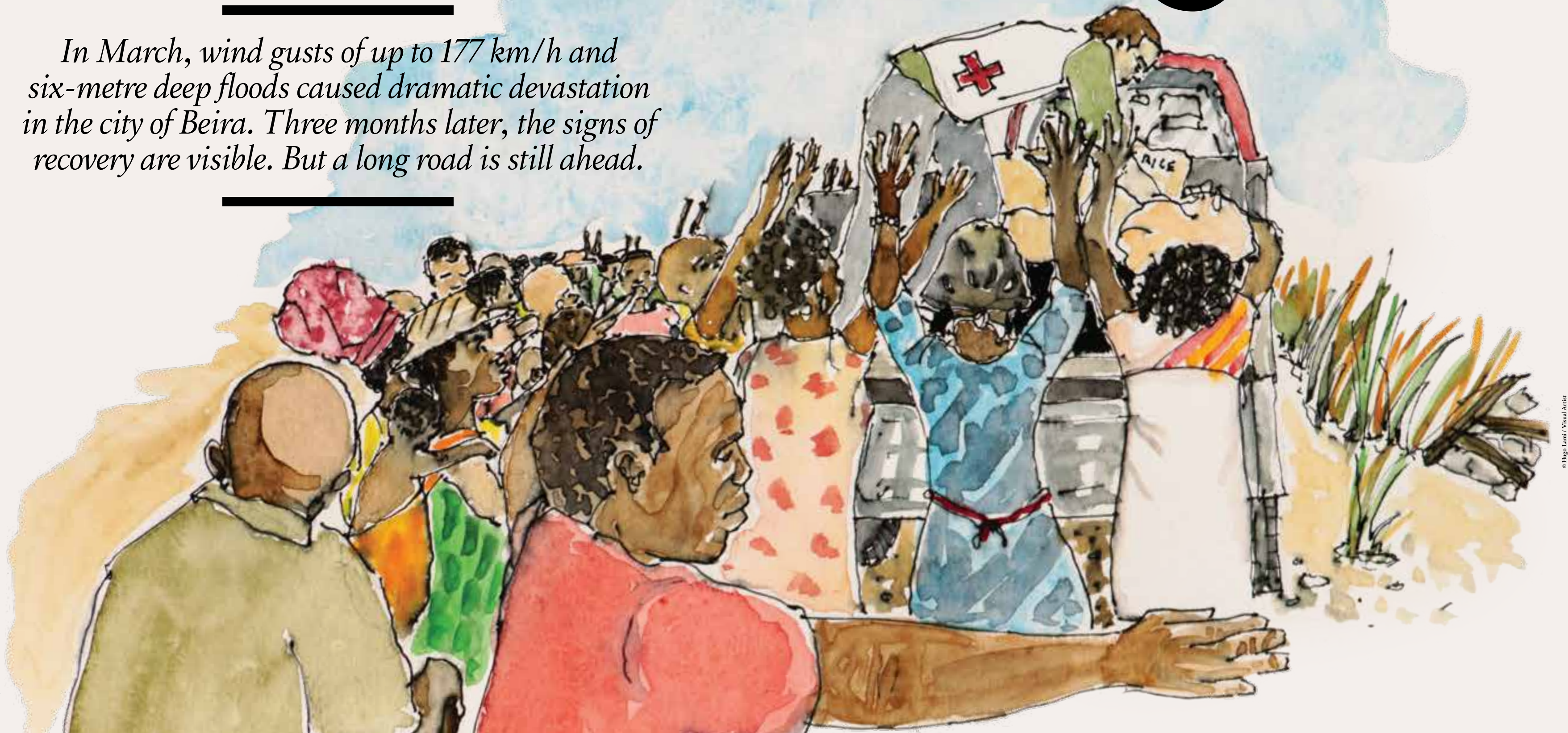
*The galleon was loaded
with gold, silver
and emeralds.*



© Jeffrey L. Roman / Getty Images

TIME FOR MOZAMBIQUE

In March, wind gusts of up to 177 km/h and six-metre deep floods caused dramatic devastation in the city of Beira. Three months later, the signs of recovery are visible. But a long road is still ahead.





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WINDOW OF HOPE

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ON the evening of March 14, 2019, the news of Cyclone Idai's path of destruction through the city of Beira shocked the world. An estimated 1.5 million people are thought to have been affected by the storm that also hit Malawi and Zimbabwe. Winds exceeding 170 km/h, heavy rains and floods swallowed cities, towns, villages, roads and fields, leaving a trail of destruction spanning 128 km in length and 72 km wide.

Nearly 100 thousand homes were destroyed and just as many severely damaged. The official death toll two months later stood at 602, with 1,640 people injured. Portugal, in particular, could not just stand idly by in the face of the worst disaster to hit south-east Africa in recent decades. Five hundred and twenty-one years of shared history, which began when Vasco da Gama made landfall on this brother country, two months before reaching India. Two nations which, almost 45 years after Mozambique's independence, still have strong diplomatic, political, economic and social ties. And who share the same language. For these reason, and if aid from the international community was seen as an act of solidarity, to Portuguese society, providing aid immediately and in any way possible was the most natural thing to do. This sense of responsibility was shared by several Portuguese entities, as if what had happened in Mozambique had happened to fellow citizens. The loss was felt across borders. One of the most notable initiatives by Portuguese civil society was aid in the assembly and operation of healthcare-related structures. Infrastructures in Beira were badly damaged and the Portuguese Red Cross (CVP) played a very important role in this regard. In the days following the cyclone, emergency response operations began to ensure the basic living conditions of the countless victims. In Portugal, an appeal was made to raise funds through operation "Embondeiro por Moçambique" (Baobab for Mozambique), the umbrella name for all initiatives and activities carried out as part of the CVP response to the crisis.

*States,
humanitarian
agencies, civil
protection
authorities and
NGOs were
engaged*

The Portuguese Red Cross launched an operation to provide aid for those in need in Mozambique.



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FROM EMERGENCY TO RECOVERY

Lara Martins,
Head of Mission,
in Macurungo's
Maternity Hospital



© Manuel Lino / Photojournalist

ON March 24, a team of 24 doctors, nurses and psychologists left on a mission to set up and operate the CVP Field Hospital in Beira. The team was led by Lara Martins, vice-president of the Portuguese Red Cross. It was her 36th birthday and the trip turned out to be her greatest gift: "It was a surprise. Especially, because we weren't exactly sure what to expect after leaving Lisbon". The difficulties they were to face, started as soon as they landed: "When we landed at Beira airport, we found that we didn't have the logistics support to unload the 35 tonnes of cargo we had with us, but we quickly turned it into a positive: we rolled up our sleeves and started unloading the plane ourselves". After 12 hours, which seemed endless, the team finally finished unloading the plane, feeling a deep bond and unwavering strength that would guide them in all their actions on the ground. "The team, which had met just three days before, only really knew who was who the next day. Until then, we only knew each other's last names. We didn't even know each other's role or job title. And I believe that that was the secret to the team spirit of the first team", concludes Lara. Six days later, a second plane with humanitarian aid for operation "Embondeiro por Moçambique" (Baobab for Mozambique) departed for Sofala, a Boeing 767 financed by the Jerónimo Martins Group and its main shareholder, the Francisco Manuel dos Santos Society. It was carrying 33 tonnes of humanitarian aid, including a field maternity hospital.

*There were lives waiting to be born,
no time could be wasted.*

Nurse Maria de Jesus Maceiras, from the Portuguese Red Cross School of Health, boarded the plane with the goal of leading a team to implement emergency mother-child protection measures and to provide related training to the local medical community. Maria knew that there were lives waiting to be born, that they could not wait for her questions to be answered. "The maternity hospital needed me. I introduced myself and started working right away, quite naturally, as if I knew my way around the department", she shares. The first birth was particularly special to her: "We were on our way out, at the end of the day, and a doctor called me to check on a woman. At first sight, the baby was not headfirst, it was sitting. Theoretically it was only one baby but, when I took a closer look - the belly was big - I heard two heart beats". This situation would normally require a caesarean section but there wasn't any time to take the mother to the Beira hospital: "When I looked back, I saw a baby coming out. Fortunately, they were fraternal twins and the birth went well. I was ecstatic." In the midst of the confusion and lack of conditions, many of these babies are born in and leave the maternity hospital without being named. Many of the families fear that the children won't survive and local traditions also have to be observed when it comes to naming a newborn.

But Maria's enthusiasm led her to christen the children that were born at the Macurungo maternity hospital with the names of her children. So "all the boys are called Tomás and all the girls are called Carlota". Two premature twin girls, born at 24 weeks, had a different fate. Maria says that these are always delicate cases, but recalls that "in Portugal, they are sent to neonatology, and the outcome varies; the conditions there are different. The only thing we could do after the two girls were born, was clean them, keep them warm and wait for them to die", she says sadly. After the emergency stage, the CVP paradigm of intervention shifted focus: "Emergency care was no longer the focus but rather improving healthcare services. The more pressing needs had been met", explains Lara Martins. "The situations we began assisting with two months after the cyclone already existed before Idai hit. The reconstruction of the maternity hospital and the healthcare centre are our two main missions and we aim to leave here with those accomplished and having empowered local human resources", she adds.

THE MIRACLE OF WATER



© Manuel Lino / Photojournalist

Threatened by a cholera outbreak due to the deterioration of health and hygiene conditions, having access to drinking water can mean the difference between life and death. DEMA, the Danish Emergency Management Agency, has placed a team of 13 operators and 6 water purification machines in Beira. The technology used turns green, foetid water into transparent, colourless, odourless and tasteless water, free from disease borne bacteria. The water to be treated is extracted from the well into a tank, carried through pipes and deposited crystal clear into two ten-thousand-litre tanks where it is stored for distribution to the population. A miracle with a touch of magic which produces a flow of 200 thousand litres per day.

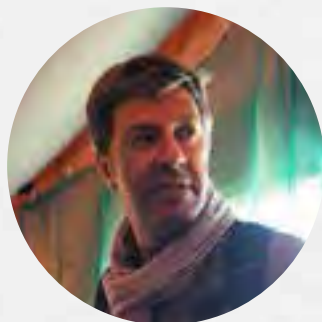
LOGBOOK

FROM LISBON TO BEIRA
AND BACK IN 38 HOURS



FÁTIMA
LOUREIRO

Jerónimo Martins



HENRIQUE
SOARES DOS SANTOS

Francisco Manuel
dos Santos Society



PLEASE DO NOT BEND



“There is a shortage of everything, from human resources to material goods”

© Manuel Lino / Photojournalist



APRIL 1

8:11 AM – BEIRA INTERNATIONAL AIRPORT.

As we step off the plane, we feel a warm breeze, a preview of the heat we would be facing. The fallen lettering from the airport’s rooftop denounced the cyclone’s fury and the trail of destruction left behind.

There was a flurry of activity, but at the Mozambican pace. Waiting for us, on the landing strip, was Commander Lara Martins, Head of the Portuguese Red Cross mission in Beira, who welcomed us with a warm hug. She’s been in the field for a week. Smiling optimistically and proudly, she shares with us that although it was a slow process and with many obstacles, the Field Hospital is now operational.

12:18 PM – MACURUNGO DISTRICT, ONE OF THE MOST DENSELY POPULATED IN BEIRA.

This is where the Field Hospital is based, right next to the Health Centre. There is a shortage of everything, from human resources to material goods. The infrastructures have been destroyed: inaccessible roads, open sewers, the roof of the building has been ripped up, the glasses in the windows are broken...



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MARCH 31

6:20 PM - FIGO MADURO, THE DEPARTURE!

We were welcomed by the Air Base Commander, along with Francisco George (Portuguese Red Cross) and David Lopes (Francisco Manuel dos Santos Society). Men and women, volunteers of the Portuguese Red Cross (CVP), set off to support the mission in Beira. Aboard the aircraft are also a mobile maternity unit, approximately 2.5 tonnes of baby products, mattresses for the maternity beds and medication boxes.

9:12 PM – ALL ABOARD, THE PLANE IS READY FOR TAKE-OFF.

We set off with the purpose of helping, offering comfort and dignity. Doctors, nurses, volunteers, journalists and... ‘us’, who joined this mission as representatives of two entities who readily provided this aircraft full of humanity and affection.



FIRST DAY OF ISSUE



NURSE MARIA DE JESUS, THE PORTUGUESE MIDWIFE WHO FLEW OUT THERE IN THE BOEING 767 FLIGHT.

She had been at CVP's Field Hospital for little more than an hour, still without her birthing kit (it was still being unloaded), but nothing stopped her from 'rolling up her sleeves' and helping three women, all very young, give birth. For three weeks, and with 45 thousand babies expected to be born before the end of 2019, her goal is to share her knowledge with Mozambican midwives.

GONALO  RF O, VOLUNTEERING DOCTOR FROM COIMBRA, AND LARA MARTINS'S RIGHT- AND LEFT-HAND MAN.

He didn't think twice when it came to setting off for the city of Beira. He's in charge of the medical and nursing teams, and has an easy smile. Alongside him, other specialty doctors, some of whom are still in training, throw themselves into the mission with all dedication and commitment.

JOANA PINHEIRO, THE PSYCHOLOGIST.

She had only been in the field for a week but, judging by how at ease she was, she seemed to have been there longer. Her role is to provide support and strength to those who need them the most. At Macurungo's Maternity Hospital, we watched the care with which she spoke to a mother and her 9-month-old daughter. They were sitting on the floor, waiting... Simply waiting, without questioning it. Little La ssa's uncle has cholera and is being treated at UNICEF's field hospital. La ssa doesn't understand what is happening around her. And just like this baby, we could see many other children on their mothers' backs, waiting in line to receive filtered water. Almost without moving, these children did not appear to have been asleep, under unbearable heat. They just looked like they had no energy. They were hungry.



Psychologist Joana Pinheiro talking to a young mother and her daughter outside the maternity.

3:30 PM – ITEM ON THE AGENDA: REBUILDING MACURUNGO'S MATERNITY HOSPITAL.

This is the most official moment in our visit to Beira. Signing the Protocol of Cooperation to rebuild the Maternity Hospital, made possible by the donations of the Portuguese to operation Baobab ('Embondeiro'). The structure will be rebuilt and equipped with everything necessary to assist future mothers, perform births and care for babies.

4:45 PM – TIME TO LEAVE MACURUNGO, BUT ONLY PHYSICALLY.

We return with warm hearts, but tinged by anxiety. There is so much to do in Mozambique. Beira will not get back on its feet in just a matter of days, months, or even years. It will take a long time. But the birth of the three little girls on April 1 are a sign of hope. Their celebratory cry when they arrived in this world was like their 'war cry', a symbol for those who don't give up on the Mozambican land and people. Interestingly, in the place where the Portuguese team is "camped out", we found a sentence which is very representative of this positive way of looking at life:... 'I didn't ask to be Mozambican, I just got lucky.'



8:00 PM – TIME TO RETURN TO PORTUGAL. WITH A FEELING OF MISSION ACCOMPLISHED.

The EuroAtlantic flight returns lighter, offering a lift to the teams from various entities who arrived in Beira immediately after Idai hit. They return with a sense of duty fulfilled. And so do we!

9:00 AM – LISBON, FIGO MADURO. END OF MISSION.





The vast majority of the houses in the city of Beira were completely destroyed and, basically, the infrastructures ceased to function. The risk of spreading diseases was one of the main concerns of the health authorities.

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© Manuel Lino / Photojournalist



© Manuel Lino / Photojournalist

Cyclone Idai's trail of devastation has ruined the sanitation infrastructures of Beira, providing the perfect conditions for cholera to spread. Lines were formed, so that thousands could receive cholera vaccines and could have safe water to drink.

MANUEL LINO



PHOTOGRAPHER AND VIDEOGRAPHER FOR ADVERTISING, EDITORIALS AND INSTITUTIONAL PROJECTS.

“THE GREATEST CHALLENGE IS GOING THE DISTANCE”



© Hugo Lami / Visual Artist



FRANCISCO
GEORGE

President of the Portuguese Red Cross

A “brick-and-mortar” memorial. Enduring and imposing, like the baobab, Africa’s most iconic tree, which lent its name to the operation launched by the Portuguese Red Cross. That is the President of the humanitarian organisation’s view on the support provided to the city of Beira. Francisco George has no doubt that donations from the Portuguese people will help rebuild the healthcare centre and the maternity hospital, but also stresses the need to prioritise healthcare consolidation through training. The head of the CVP praises the field maternity hospital which, he believes, makes a difference in the lives of many mothers and those of the children born in the wake of Cyclone Idai.

WHEN DID THE PORTUGUESE RED CROSS DECIDE TO GREEN LIGHT OPERATION EMBONDEIRO [BAOBAB]?

Humanitarian aid, international cooperation, is part of our DNA. The CVP’s mission is to help reduce human suffering, without discrimination, whether in the context of conflict or as a result of a natural disaster, as is the case with the city of Beira. That is why we decided to collaborate on, lead and implement a mission in all its stages. In the first stage, search and rescue, the Red Cross worked with experts in restoring family links. This was immediately followed by sending a field hospital, via a chartered flight paid for with donations from the Portuguese people. And then, the following week, another flight was sent, this time financed by the Jerónimo Martins Group and its main shareholder Francisco Manuel dos Santos, making it possible to set up in Beira a field maternity hospital with the appropriate equipment, including ultrasounds and other devices.

HOW WAS AID FROM JERÓNIMO MARTINS RECEIVED?

Jerónimo Martins donated over 210 thousand euros, well over what it cost to charter the plane for the direct flight. It was a Boeing 767, carrying more than 33 tonnes of cargo, including the field maternity hospital. Not to mention that most of the supplies taken to Beira were donated by the Group’s companies. In terms of child care, for the mothers and children in Mozambique, we speak of two different times, the before and after: the before, with significant shortages; and the after, with devices, equipment, supplies and resources.

ARE THE DONATIONS ENOUGH FOR THE CVP TO IMPLEMENT THE INITIATIVES IT HAS IN MIND?

We have a cap of 5 million euros to sustain the operation until the end of reconstruction. The maternity hospital was badly damaged by the cyclone and needs masonry work, the healthcare centre has four departments that incorporate the field hospital. That is, the CVP’s field hospital and the maternity hospital are at the heart of a healthcare centre comprising other buildings that are being rebuilt with the help of Portuguese donations. It is going to be a completely new maternity hospital. We will continue to invest in this project, which will stand as a brick and mortar memorial. We will then give the field hospital to the Mozambican Red Cross, together with funds to transfer it to Maputo. Then, in cooperation with Mozambique, we will kick-off an extensive training and service programme for midwives and child caregivers.

“We know that knowledge can never be destroyed. This is the belief that drives the CVP and its partners”



© Manuel Lino / Photojournalist

WHAT STORIES OR IMAGES TOUCHED YOU THE MOST?

Children. Children being born. The birth of a child is an extraordinary thing. It is always very emotional. Especially when it occurs in the midst of such devastation, such death – hundreds of lives lost – the birth of a child and having the best conditions for the birth is, of course, a vocation.

WHAT ARE THE BIGGEST CHALLENGES AHEAD?

Going the distance. It cannot be a one-off thing. Most organisations that came to support emergency operations left Beira after a few weeks. We went the other route: we helped in the emergency, but we stayed to aid in healthcare consolidation. The fact that there hasn’t been a large cholera epidemic is a victory that should be studied, because basic sanitation infrastructures were wiped out by the floods. We had small cholera outbreaks, but a group of organisations, including the World Health Organization and the International Red Cross, quickly worked together to meet the need for drinking water and the elimination of faeces, and this was a win. On the other hand, we will conclude the projects we are able to implement with the help of Portuguese donations. But more is needed. They went beyond expectations, but fell short of what is needed. Then there is the training, to ensure the operation is a success. We know that knowledge can never be destroyed. And should another cyclone hit, if knowledge remains intact among healthcare workers in the city of Beira, it won’t be destroyed. This is the belief that drives the CVP and its partners.

THE DEVASTATION OF CYCLONE IDAI



© Manuel Lino / Photocjournalist

TREES

were ripped from the asphalt and dumped onto the streets of the city of Beira in central Mozambique. Those who were in the city when Cyclone Idai hit recall the deafening roar of the winds, the sudden change of wind direction and roofs flying. Children in fear in the midst of all the chaos. “Daddy, are we going to die?”, asked a child while his father was trying to comfort him saying that it would all be over soon. The roof of the house that sheltered them was being ripped off by 200-km winds. Beira was disfigured. A city full of beautiful modern buildings, albeit in need of maintenance for some decades, was now fallen. Information available indicates that 90% of the city was affected by Cyclone Idai.



© Manuel Lino / Photocjournalist

But Beira, a coastal city along the Indian Ocean, below sea level, wasn't the only area in Idai's path of destruction. In addition to strong winds, floods hit a large part of central Mozambique, as well as Zimbabwe and Malawi.

The airport is the main staging area to address the crisis in the wake of the devastation. It is where cargo planes loaded with humanitarian aid are constantly arriving. International organisations and a group of Mozambican authorities have set up a command centre at the airport to coordinate how to get aid to those who need it.

Damage extends across 4 provinces: Sofala, Manica, Tete and Zambezia. The United Nations says that as many as 1,800,000 people may have been affected.

There are significant challenges in the first stage of aid, which focuses on search and rescue, as rivers are overflowing. What was once *terra firma* has been transformed into murky oceans spanning more than 100 kilometres in length and 25 kilometres wide. Aid can only be flown in by helicopter or brought in by boat.

Many Mozambicans have taken refuge atop trees or on the terraces of the tallest buildings. In the town of Buzi, one of the areas heaviest hit, river water overran the dock, flooded the street and engulfed houses and palm trees. Women and children were the first to be evacuated. When we reached the Buzi dock, by boat, the area was full of men. But these are resilient people who, despite still being up to their ankles in water, do not want to leave their home. Those who are at the dock hope primarily that aid reaches Buzi, so that they can have access to food, shelter and drinking water. Their insistence on wanting to stay in such a devastated area is simple: they are part of the vast majority of Mozambicans who built their lives on subsistence farming, and it is how they've learned to survive. Urban life is foreign to them and they fear that when emergency aid is withdrawn, they will be unable to find the resources they need to rebuild their lives in an environment that is unfamiliar to them and they'll end up wandering the streets. That is why they insist on asking for aid to be delivered to the areas where they have always lived.

On the day the winds came, the 14th of March of 2019, Simone was born in Buzi. At night, the hospital lost its battle against the strong winds and Simone's mother, Beatriz, grabbed her daughter and ran home. It rained heavily and the house collapsed. They abandoned it and sought refuge at the local school. From there they ran to the terrace of D. Ivone's bed and breakfast. A rescue team eventually evacuated them and they were taken by boat along the river to a shelter in Beira. Beatriz says that Simone cried the whole time it was raining and thought “I didn't think I would be able to save her”. But Simone survived it all.

The scale of devastation is clear when one flies over the affected areas. Vast areas of flooded lands where, bit by bit, patches of green can once again be seen and small villages are being rebuilt, most of which are empty. The death toll will be hard to estimate given how difficult it is to get to the various locations and the water currents. In light of the magnitude of the catastrophe, the World Food Programme has appealed to international donors for aid in the amount of US\$ 282 million as recovery will take time.

Many areas are unrecognisable and scores of people are missing. Approximately 75 kilometres from Beira, near the N6 national road, which connects the important port of Beira to Zimbabwe, Malawi and Zambia, lies the municipality of Lamego, comprising 32 wards. Survivors grab black plastic bags to use as makeshift shelters. Martinha Vontade and Ania Jairoze recall how the water rose until it reached their mouth and how they saw three canoes full of people tip over and their occupants being swept away, defenceless against the currents. João Braz is the secretary of a ward with 2,360 inhabitants. He says that only 19 of the ward's 421 houses still stand. Not far from there, in Tica, Manuel Domingos sifts through the soggy land where the house he lived in with his family once stood.

His wife and children are safe, but he has no money, nothing to rebuild his life with. Among the wreckage, he finds his documents in what is left of a mangled suitcase.

In the wake of the cyclone and flooding come cholera and malaria outbreaks. International aid, including from Portugal, is focused on water purification, one of the immediate problems. It is also focused on medical care.

And then there's the children, many of which are very young. They are running around barefoot, between fallen houses and in puddles of stagnant water. Survivors of yet another cyclone, another flood. They are resilient, oblivious to what tomorrow brings. People have promised that humanitarian aid will continue, that it will help Mozambicans rise up from this tragedy. They just want to pick up the pieces. Again.

CÂNDIDA PINTO



JOURNALIST
ASSISTANT DIRECTOR OF
INFORMATION AT RTP, THE
PORTUGUESE PUBLIC NETWORK

NOT ALL HAS GONE WITH THE WIND



© Hugo Lam / Visual Artist

PEDRO BELLO MORAES



JOURNALIST
SENIOR REPORTER IN
INTERNATIONAL NEWS DESK
AT PORTUGUESE TELEVISION
BROADCASTER TVI.

IT was on the last day of reporting that we saw Idai. The cyclone was slow to make itself known. But ruthless. Like winds, the children ran criss-cross, rampant, knocking down anything in their path to get there. Their destination? Biscuits. Small and fiercely coveted biscuits.

The firemen, dotted around the ground like trees laden with fruit, set up the distraction. With their arms in the air, like branches stretched out. Their legs, stumbling over the human mass, unsteadily bending, like the trunks that were broken on 14th of March.

The distraction fell flat, bowled over by a single word. Uttered by someone without knowledge of Portuguese but who feels what they say.

“Famine! There’s famine, here!”

The woman screamed her heart out as the head fireman spoke to the chief of the Anhonha locality, near Mafambisse, 50 kilometres north of Beira.

That’s the rule. Counting on the local chief, respecting the authority of the place.

But, the woman...

“Stay. No leave us.”

Words trampled by despair, spoken in a Portuguese salvaged from dire need. The woman knew there was no authority whatsoever there. That’s why she asked those distributing food there to stay, for them to ensure that help would reach everyone.

Wounded animal could sense the risk. She was sure that Idai was around the corner. She was right.

More than 20 days after destructively making landfall in central Mozambique, the cyclone was still dominating those people. Turning them into a whirlwind like air grappled in spirals.

Women, men, children. All frantic. Desperate. Fighting over a bag of flour. Elbowing each other over a tin of food. Trampling on each other over a packet of rice.

“It’s the famine”, we heard the fireman confide in horror.

Yes, it’s the famine, we said.

Almost one month after the disaster, we saw famine as the most worrying root of the most violent cyclone ever to hit Mozambique.

A tragedy that is also a topic of conversation and study. And that could be clearly seen when we visited Escola Primária Completa Heróis Moçambicanos (Primary School), in the Maquinino neighbourhood of Beira.

“Idai is a terrifying wind. Everything goes with it. It kills. Metal sheets flew. We were praying. Everything went dark. Many people died.”

The description of the day/night in March was given to us by Gomes, a small, extraordinary nine-year-old boy who is already a brave soul. The survivor of a natural disaster that claimed over a thousand lives in central Mozambique, Gomes, in a sky-blue shirt and tie, sitting in the front row of the classroom filled with dozens of children dressed like him, started by replying as a diligent pupil, keen to demonstrate what he knew.

And he knew. He really knew what he was talking about. Unravelling the “matter” soon led to emotion. His last words were spoken in a choked voice with tears in his eyes.

The memory of the nightmare is still vivid. It’s everywhere. Gomes is confronted with it when he goes to bed at night and when he wakes up in the morning. When he’s lying on his back, in his bed, it’s the sky that he sees. The house is still roofless. Sheetless, that’s the word we made up to illustrate the lack of zinc sheets, the material used to cover 99.9999 % of housing and constructions in this part of Mozambique.

Houses, shops, courts, police-stations, hospitals, all sheetless. A permanent image in the streets that Gomes picks his way down to get to his school, which has also been destroyed. Of the four blocks, two have been left open to the sky. Of the 14 existing classrooms, 6 are no longer in use. And when panning the structure, there can be no doubt that more than 50% have been demolished.

A sample of the overall extent of the damage in the city, villages and schools in central Mozambique.

“95% of our 120 schools in Beira were destroyed”, Nasser Teixeira de Sousa, the district education director tells us.

“We have schools operating outdoors. Because we don’t have classrooms; in all the establishments we were obliged to form larger classes, but lessons recommenced not even a fortnight after the cyclone.” The triumphant director states, with a sparkle in his eyes.

“A lot of things have gone with Idai, but not your good spirits”, we concluded.

“No! Not all has gone with Idai. And we managed to re-start the school year. Not all is lost.”

Indeed not, we also thought. Along with the deaths, many, many more than the official 603 - shockingly below the number of bodies which are gradually being unofficially reported in the more remote areas of Sofala, Manica and Inhambane, as the bishop of Beira told us; along with the more than one billion euros needed, according to the World Bank’s estimates, to re-build some 320 thousand homes destroyed in what is among the nine poorest countries in the world, despite everything, there is still a lot to tell.

Tragedies like Idai display the violent, inclement, deadly, human drama, but not only that. There’s still the other side, otherwise this would be lopsided. A lament. And the other side, or rather, the whole side of this story is really the human one, the one given to us by the whole world that mobilised to help. We wandered around central Mozambique and came across NGOs, volunteers from dozens of wealthy countries, various UN agencies, movements of anonymous citizens who left Maputo to settle in Beira as members of the more vigilant and committed civil protection. And that gives hope. To us and to the Mozambicans who are unparalleled in their hospitality to others.

More expressive than most peoples, there is a lightness to be found in the gaze of Mozambican children, women and men, old and young. They are gradually awakening from the nightmare, shaking off the stupor into which they plunged as the rivers overflowed, wiping out everything in an area equal to half of Portugal.

And they smile. With their whole face, a beaming smile which tells us that not all has gone with Idai.



© Manuel Lima / Photojournalist

Pedro flying with the Portuguese Red Cross to Beira

THE FINAL STRAW

Plastics' old problems cry for new solutions. Companies are finding ways to transform plastic waste into new products. The more recovered, the less ends up in the environment. It is the last straw and the beginning of a new era.

BOTTLES FROM THE BOTTOM



Plastic is a durable, stable and affordable material.

PLASTIC has enriched our lives in many ways. It is durable, stable, affordable and enables the creation of important items, from heart valves to eyeglasses. It also protects products for consumption, ensuring safety, reducing contamination, and extending shelf life while improving fuel efficiency in transport due to its light weight. The rise of plastic use across various industries over the past fifty years can be attributed to these qualities. Yet, many of these qualities are exactly what makes plastic such a threat to our oceans and freshwater bodies. Plastics have been detected in water taken from all oceans and freshwater systems are not free from contamination either: according to projections taken from the World Economic Forum's New Plastics Economy report, the volume of plastic being dumped into the oceans will double by 2030, and it is expected that, by weight, there will be more plastic in our oceans than fish by 2050. While plastic packaging is not the sole cause of ocean plastic waste and marine litter, packaging producers are expected to lead significant change by presenting solutions to support healthier aquatic ecosystems.

TOWARDS A CIRCULAR ECONOMY

Litter is either the consequence of an end user's behaviour or the lack of available waste management infrastructure to handle the material in that end user's geography. But that does not mean that the packaging community cannot promote change in the consequence of the 32% plastic collection leakage (World Economic Forum) and drive towards a Circular Economy, a restorative and regenerative model where materials flow in a continuous loop. Incorporating recycled content into packaging supports and strengthens recycling programs that are critical to the circular economy. There are examples in the marketplace of companies that use a percentage of recycled ocean and river plastics debris in their packaging by collecting them from aquatic environments, separating them from non-plastic debris and then re-processing them to form plastic pellets that can be incorporated into new packaging.

RECYCLING MARINE PLASTIC

@Jerónimo Martins

Pingo Doce and Biedronka launched a dishwashing detergent with a packaging that incorporates 11% of plastics taken from marine environment – reducing plastic pollution in these ecosystems – and 89% of post-consumer recycled plastic. The 100% recyclable plastic bottle follows the principles of a circular economy, thus facilitating its transformation into new materials after use.

**100%
RECYCLABLE**

**11%
MARINE
PLASTIC**

Pingo Doce/Biedronka new dishwashing detergent bottle made of 100% recyclable and recycled plastic.



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**89%
POST-CONSUMER
RECYCLED PLASTIC**

Using marine plastics helps to increase consumer awareness of this issue.

Despite the volume of plastics in the marine ecosystems, collecting them isn't cheap or easy. Even the infamous island of junk floating in the Pacific is so diffuse, that it isn't practical to just scoop it out of the water. The trick is locating exactly where along the shorelines it collects in enough quantity for local teams to gather, sort through and process at a commercial scale. Re-purposing debris is also costly because it is difficult to sort such a wide range of mismatched sizes and colours of so many plastic resins; this being, ocean plastics are usually blended with other recycled materials to maintain packaging quality and stability. Although the time and additional cost of using marine plastics are still a major hurdle and not yet a scalable solution, it does help to increase consumer awareness of the issue and provides support to clean up projects working to conserve shorelines and aquatic environments. With companies constantly striving to balance profit with demand for sustainability, will more packaging producers enter the field in the future? We are seeing a paradigm shift, with numerous companies introducing waste management infrastructures and supporting deposit return schemes. Increased collaboration among stakeholders, commitment to sustainability and demonstrated viability will drive more packaging producers towards ocean plastic, boosting demand and lowering costs over time. With global plastic production projected to rise, and plastic packaging representing the major share of this leakage into aquatic environments, our oceans and freshwater bodies need companies to act more decisively than ever before. While packaging producers cannot solve the global plastic pollution crisis alone, they are well positioned to advance the circular economy to reduce the consequence and scale of packaging's impact throughout the value chain, where scientists, policymakers, consumers and other stakeholders can fuel momentum and collaboration and drive long-lasting, meaningful change.

GUARDIANS OF THE SEA



Fishing for plastic using a surface trawl attached to fishing boats.

THE ocean remains one of the most expansive, mysterious, diverse and full of life places on Earth. But we are not doing enough to protect it: some eight million tonnes of plastic end up in the oceans every year. That's the equivalent to fifteen grocery bags filled with plastic for every meter of coastline in the world. Plastic litter keeps being accumulated over time at the centre of major ocean vortexes forming 'garbage patches' – large masses of floating debris fields across the seas. Each of the major oceans have plastic-filled gyres, including the well-known 'great Pacific garbage patch' that covers an area roughly equivalent to the State of Texas. What can be done? NGOs like Waste Free Oceans, a Brussels-based public-private partnership, are now addressing this growing concern of marine litter and committed to fight and prevent it, by partnering and collaborating with fishermen and local communities from around the world in the collection of ocean waste.

Founded in 2011 as an initiative from the European plastic converters association, WFO has since grown into an independent organisation relying on funding from public donations, project collaborations and corporate partnerships. It operates worldwide and its network is spread all over Europe, as well as in Asia and the Americas, from countries such as Belgium (where it is based), Portugal and Cyprus to Turkey, Hong Kong or the Dominican Republic, to name a few.

WFO's main goal is to reduce, reuse and ultimately recycle marine litter, mitigating its global impact on both the environment and natural resources, by mobilising fisheries, recyclers, manufacturers, brands and policy makers to try to solve this problem. This is why its main operations include conducting marine litter and beach clean-ups, policy advocacy and collaborating with partners on 'closing the loop' projects, designed to transform collected marine litter into new, innovative products, thus promoting the circularity of materials.

HOW IT WORKS

Material litter hotspots are first identified by local partners. Fishermen play a key role in this environmental process, as they are present in the fishing areas all year long they are familiar with local water conditions. They also have the necessary technical knowledge and tools, such as vessels, to keep a good surveillance across large sea areas. Using a quite simple trawl that can be attached to their regular fishing boats, fishermen can 'fish' for plastic bottles, the so-called 'ghost nets' and other plastic wastes in their idle fishing days, collecting between two and eight tonnes of marine litter in each journey. But even though there are huge amounts of plastic out there in the oceans, overall the quantities collected are just a few hundred tonnes per year.

THE AZORES PROJECT

One of the local partnerships developed by WFO is located in the Portuguese archipelago of Azores and aims to clean-up and prevent plastic pollution in the Atlantic Ocean. The overall goal of the Azores project is to remove floating marine litter of the coastline of São Miguel island and raise awareness of stakeholders by collecting information that proves the impact of marine debris. It will also assess how WFO could set up a preventive collection scheme for obsolete fishing gear by applying for a Fishing for Litter project under the European Maritime and Fisheries Fund, in which fishermen and local organisations could be involved. Nowadays, the world is ready and waiting for products offering environmental solutions. People are demanding sustainable choices and are getting ready to pay for them. Some years ago, the western world was not yet aware of the impact of marine litter, nor was it prepared to get involved. Today, it has become clear that instead of extracting more natural resources to produce even more plastic products, everybody is getting eager to use more and more sustainable solutions.

WFO's main goal is to reduce, reuse and ultimately recycle marine litter.



Fishermen play a major role in this environmental process.

Riding **THE WAVE OF SUSTAINABILITY**

Jerónimo Martins enters the main surfing competition in Portugal to prove that “knowledge is our best defence” to preserve our richest and most fragile natural heritage: the ocean.

PROMOTING SUSTAINABILITY AT THE PORTUGUESE SURFING CHAMPIONSHIP



Gony Zubizarreta won the league's second stage in the men's category. He shared the podium with Miguel Blanco and Nicolau von Rupp.

FIVE stages. Five beaches. 97 surfers. 100 thousand euros up for grabs. The MEO Surf League, the main surfing competition in Portugal, will be held across the country until October. After a stop in Ericeira, Figueira da Foz, Porto and Algarve, it is Cascais' turn to introduce the new champions. Miguel Blanco and Camilla Kemp will be defending their titles, but there's a lot more at stake in this year's competition.



Snacks and sustainable gifts reward the surf lovers' knowledge of the oceans.

On land, the organisation is consolidating its sustainability footprint and the Jerónimo Martins Group is joining this mission with a campaign to raise awareness for the preservation of the ocean and the need to adopt a healthy lifestyle. “Knowledge is our best defence” (“Quem mais sabe, melhor defende”) is the motto of the initiative that the Group is taking to national beaches to test what surf lovers know about the ocean, the challenges we face and what we must all do to protect marine life. The competition rewards the correct answer to 10 multiple choice questions with healthy snacks and sustainable gifts, such as lunchboxes, reusable water bottles and bags, among other surprises. The blue passport needed to ride this wave of protecting marine life is within the reach of all surf fans who, during the five stages of this championship, are drawn to the cause and want to embrace it.

Jerónimo Martins is joining this mission with an awareness campaign



To enter the competition “Knowledge is our best defence”, the beachgoers only have to ask for this blue passport and join the ride.

The President of Portuguese National Surfers Association (ANS - Associação Nacional de Surfistas), Francisco Simões Rodrigues, believes that “having an important business group like Jerónimo Martins sharing a vision for the future with surfers is something that all beachgoers in Portugal will benefit from” and believes that the Group's commitment arises in the context of “a shared attitude that not only shows concern but effective action in environmental sustainability, particularly in biodiversity and protection of the ocean.” The ANS President believes that initiatives like this will impact over two thousand people this year, especially the “adults of tomorrow”. The event also appointed a sustainability ambassador for this year's competition, João Kopke, top 5 in 2018, national Under-14, Under-16 and Under-18 champion and European runner-up at the Under-16 Grom Search.

DEEP BREATH



Sofía Gómez Uribe is a close defender of pollution free oceans and clean beaches. She's not an environmental activist, but she makes environmental causes a mission while pursuing her deepest dive.



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THE LURE OF THE DEPTHS



SOFÍA GÓMEZ

Freediver

SOFÍA Gómez Uribe was born in Pereira, Colombia, in 1992. At the end of 2018 she established a new world record of freediving with two fins. She went down to 83 meters deep, in a dive that lasted more than three minutes. Sofía started practicing water sports as a young child, but it was only in 2011 that she discovered her passion for a dangerous mode of living unknown to many, which provides images of rare beauty. Free diving in apnea should be considered as a high-performance sport, since it requires strength, precision, breathing capacity and a lot of mental focus. The passionate way she talks about the bottom of the sea and the challenges she faces to overcome her personal fears makes the conversation with Sofía Gómez easy and captivating. Sofía decomplicates what is a challenge within the reach of only a few and that demands permanent sacrifices. At the end of the conversation, we find ourselves wondering about how hard it must be to test our own personal limits in an environment with no conditions for human life.

WHAT IS THE MOST BEAUTIFUL THING ABOUT DEEP SEA DIVING?

First, the joy of reaching the goal I set for myself. Second, the loneliness you feel down there, but not in a negative way. People say: “The loneliness is such a drag! How sad! How depressing!”. But when you are in the depths of the ocean and feel the loneliness, you realise that you rely 100% on yourself. You have to trust in who you are, in what you can do. For me, this is very hard because trusting in what I’m capable of doing is very complicated [laughs]. The truth is that 90% of the time, I think I can’t achieve the things I want.

AS A RECORD HOLDER, WHAT DO YOU THINK YOU NEED TO DO TO IMPROVE YOUR RECORDS?

Take more risks, carefully of course. Not being afraid of pushing my own limits or reaching the limit to know where it is, because I know I still haven’t reached the limit of my capabilities. I’m nowhere near my limit. Then, keep training. Training is the most important thing, not only physically but also mentally, which is the hardest.

WHAT ARE THE MENTAL CHALLENGES IN DIVING?

The hardest thing is to be able to focus on just one thing and control the negative thoughts, freeing your mind from dark thoughts. I didn’t use to meditate, but now I’m learning how to do it and it’s helping me a lot. I used to try to block out negative ideas and it didn’t work. Now, I simply let them flow. I’ve started meditating with an app called Headspace which I really like.

IN A DIVE, HOW DO YOU BALANCE DEPTH AND TIME?

I trust in what my body tells me. Something that is very difficult for me, apart from the mind control, is equalising the pressure in my ears. I have been working on this and struggling with it all this time. For example, I did really well in one of the last competitions, I got to the bottom with plenty of air. Then I thought: “Well, if I still have air, I can still go deeper”.

“I know I still haven’t reached the limit of my capabilities. I’m nowhere near my limits.”

HOW DO YOU CONTROL THE PRESSURE IN YOUR EARS?

By using the “Mouthfill” and “Frenzel” techniques. After some depth, the lungs are so compressed that you can’t release air to compensate, which is what you do... [she fills her cheeks with air]. This is a technique where you don’t use the diaphragm but rather the throat to force air towards the ears but, as the lungs are so compressed, this air does not get released. So, before getting to this residual volume – which is what we carry with us – I fill my mouth with as much air as possible. I close the glottis and, with that air in my cheeks, I go till the bottom. Then, if I get distracted, I swallow this air and that’s the end of my immersion because I can’t continue descending.



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“I want to go down more than 100 metres, hold records in all categories and prove to myself that I can make it”

WHAT DO YOU WANT TO ACHIEVE NEXT IN YOUR CAREER?

I don't know if this may sound a little weird, but when I achieved my first record people used to ask me: “Well, what's next?”. And I would answer: “What do you mean what's next? I haven't done anything!” I mean, you must always keep humble because this is the thing: to me, what I do is very important, but for others it doesn't matter at all. I haven't achieved what I want to achieve yet: I want to go down more than 100 metres, hold records in all categories and prove to myself that I can make it. More than anything else, the most beautiful thing is this inspirational role you play for people. It's like saying: “Hey, I can do a crazy sport, in which I defy the laws of Physics and nature... If I can do it, you can also do whatever you set your mind to and work hard for.”

WAS SOCIAL MEDIA RELEVANT IN YOUR RECOGNITION?

100% relevant. I think if I'd been a free diver twenty years ago, nobody would've known about it. Social networks are a really positive tool if you see them in this way, and I always try to see them as a positive thing. It's very nice to be able to see all the people's support. Of course, there are always trolls but, literally, there is one troll among thousands of comments from people who say: “How beautiful! How inspiring! Thanks a lot!”. And without social media, I wouldn't have sponsors, I wouldn't have as much visibility, I wouldn't have what I have today.



© DuanVerhoeven

COULD YOU COMPARE AN IMMERSION WITH LIFE?

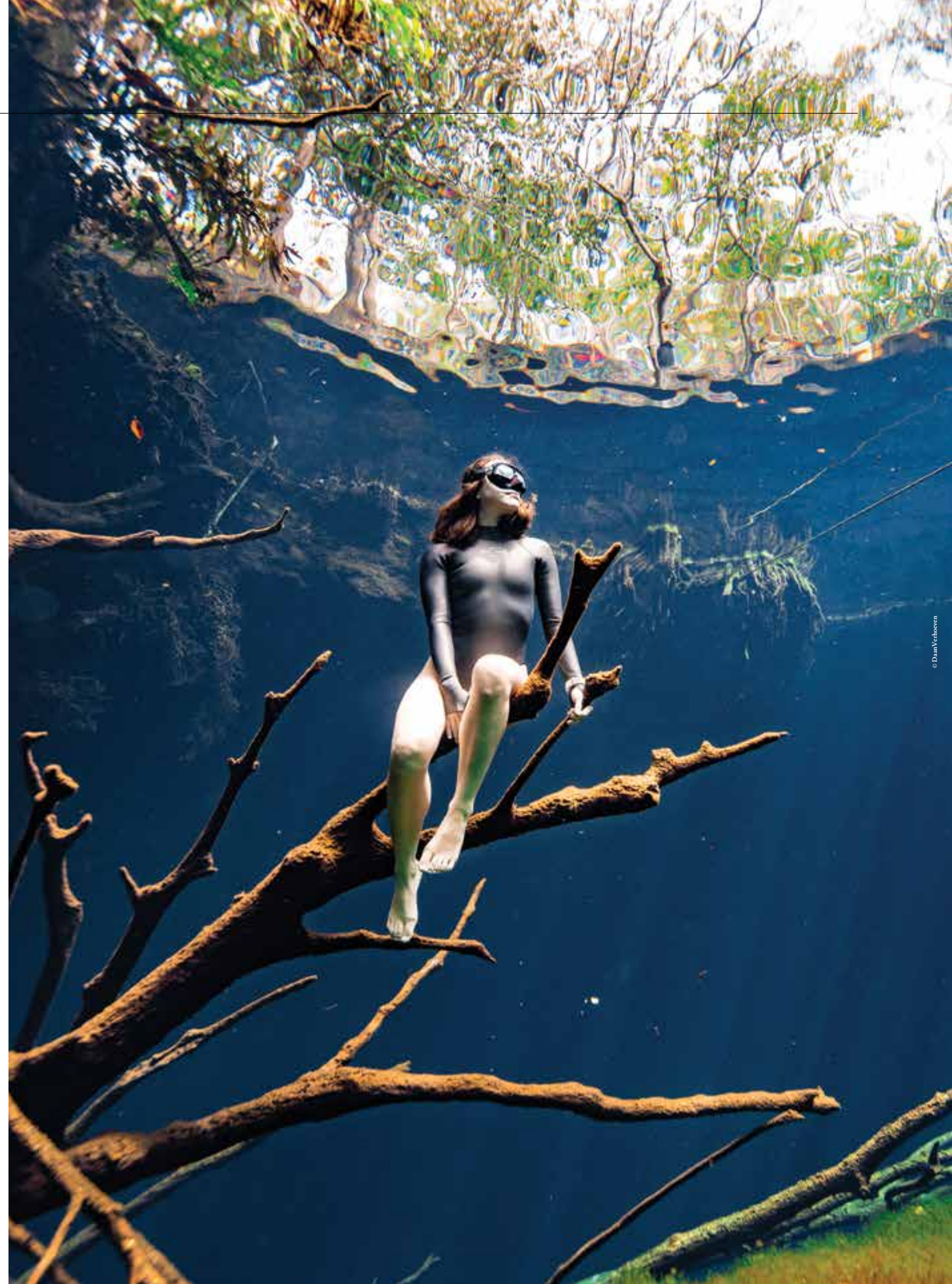
An immersion is a very short period of time, around three minutes. But it seems like an eternity because you're not breathing. And in one immersion you can have a thousand thoughts crossing your mind. It's up to you to let the negative thoughts go, to “turn them off”, to take all the positive ones and use them in a way that is beneficial for you. Life is like that too, it's a handful of processes, you must have a very clear goal and not let those bumps in the road affect you.

WHO ARE THE THREE PEOPLE YOU ADMIRE THE MOST?

Perhaps, the people I admire the most are in sports. I admire Serena Williams because of what she represents for women, for mothers, for the African culture. She's a woman who has broken a lot of barriers in a very elitist sport such as tennis, who breaks the stereotype of a female tennis player and right now is a mother and keeps on competing and winning. All that inspires me a lot. Plus, the strength she has and the fact that she is authentic, she doesn't hide her feelings: if she's angry, she breaks her racket right there and let's everybody see she's a real person with feelings. I also admire the cyclist Rigoberto Urán for his strength and tenacity, because he demonstrated that with effort, dedication and hard work anything is possible.

AND THE THIRD?

Well, I know it's a cliché but... my parents. My father is a very hard-working person, who also doesn't give up in the face of adversity and always has a clear goal. My mom is also a very inspiring woman... I think that being a mother isn't an occupation, it's more like an extreme sport. It's something no one gives real value to: “Oh, you're a housewife, you're a mom? You do nothing.” My mom used to have her own office, she's an architectural designer, but quit her job to raise my sister and I as best as she could. My mother is a key part of what I'm doing now. She used to get up with us at 4.30 am to take us to the swimming pool, to training, take us to school, take us back to training, so she has been... It's like she gave her life for us, so that we could be who we are.



© DuanVerhoeven



FROM FIELD TO SPOON

Behind the magic hands of the Polish grandmother is a secret none will dare to unveil. What if her delicious consommé was store-bought? To celebrate the 3rd anniversary of our soup factory, chef Kuba Kuron cooked three of the most beloved Biedronka recipes.

KUBA KURON



CHEF AND COOKERY COACH. FOR THE PAST 12 YEARS, KUBA HAS BEEN RUNNING WORKSHOPS, COOKING SHOWS, TRAINING SESSIONS AS WELL AS EVENTS FOR COMPANIES AND ORGANISED GROUPS. THE CHEF HAS HIS OWN COOKERY SHOW ON YOUTUBE AND IS THE AUTHOR OF MANY BOOKS, NEWSPAPER ARTICLES AND TV PROGRAMS.

CARROT CREAM SOUP

Carrot is one of the most commonly used root vegetables in the Polish cuisine, which serves as a basis for every single broth. This soup recipe in particular is mostly appreciated by children, thanks to its delicate and naturally sweet taste. For a thicker and hearty result, lentils can also be added.



© Rafał Mieska

A RECIPE FOR SUCCESS

The Polish village of Parzniew is home to the Jerónimo Martins Soup Factory. Five tonnes of fresh vegetables are used to make over 15 different varieties of this deeply rooted food staple, as an average Pole eats over 100 litres of soup per year.



© Avel Marlowicz

HOW IT ALL BEGAN

Production at the Parzniew factory began in 2016. Three cream soup varieties - tomato, broccoli and cauliflower - were introduced in the market. Biedronka launched a large-scale advertising campaign to kick-start this project.

MORE FLAVOUR

A year later, new cream soup varieties were added to the portfolio: pumpkin, garden peas, courgette, carrot and red lentil, beetroot and red lentil, tomato and pepper with chickpeas, corn and millet, wild mushroom and sour rye with potatoes.



© Fabryka zup

3,000
TONNES OF SOUP
PRODUCED IN 2018

BESTSELLERS

The three cream soup bestsellers are currently the tomato, pumpkin and carrot varieties.

CONVENIENCE

With Poland being the largest soup consumer in Europe, practical ready-to-heat and ready-to-eat food solutions were well accepted by Biedronka's clients and consumers. These exclusive soups are made using selected Polish ingredients.

FOOD SAFETY AND TRAINING

With consumer safety in mind, the Soup Factory has implemented quality assurance systems and requires its suppliers to certify their products in accordance with such systems. The Group takes a "pharmaceutical" level of care approach to ensure high product quality.

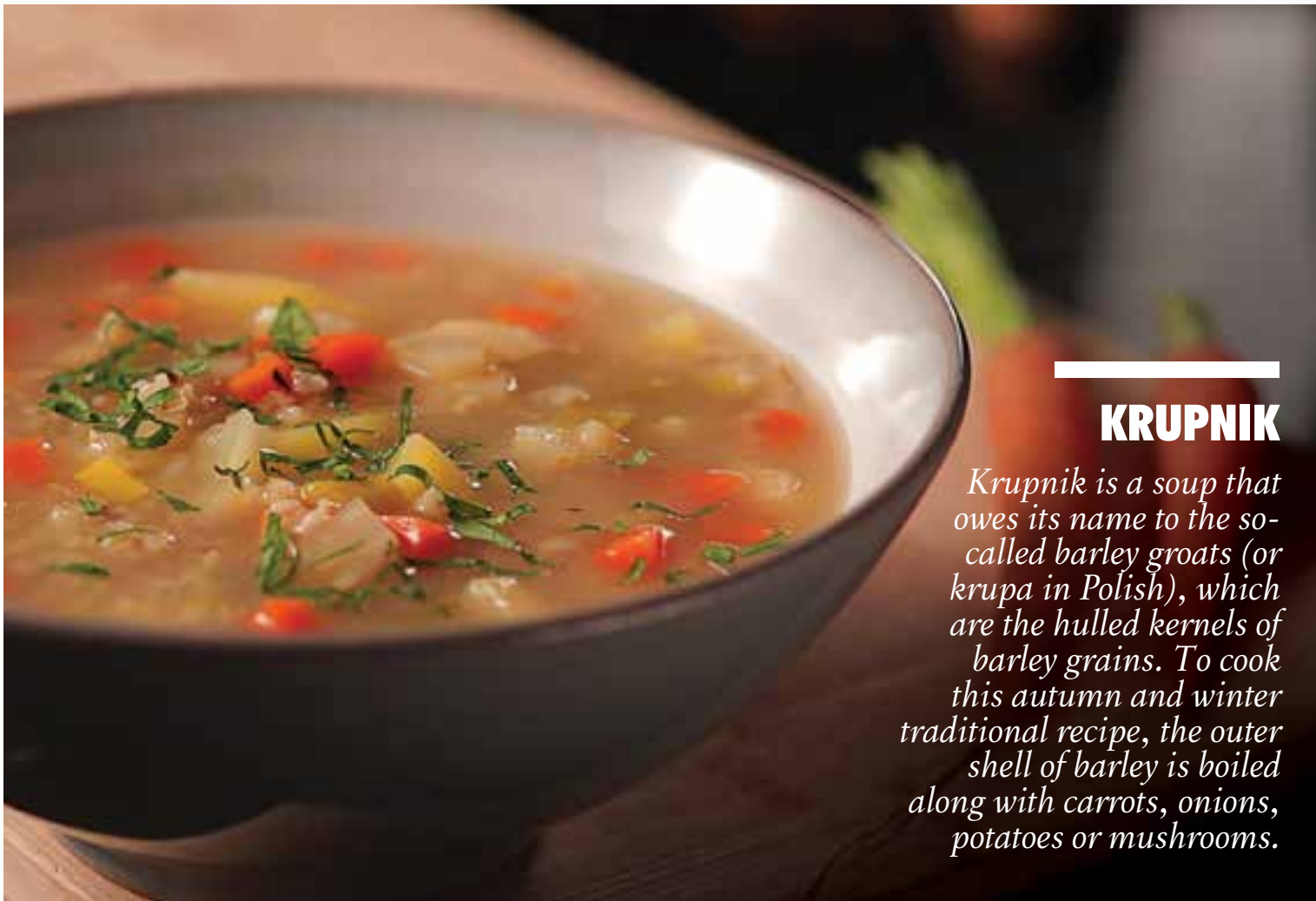


© Arek Markowicz

"From the very beginning, we have been working mainly with the same farmers. This allows us to maintain elevated product quality and consistency", explains Marek Grubiński, director of the Soup Factory.



© Exopixel Shutterstock



© Rafal Meszka

KRUPNIK

Krupnik is a soup that owes its name to the so-called barley groats (or krupa in Polish), which are the hulled kernels of barley grains. To cook this autumn and winter traditional recipe, the outer shell of barley is boiled along with carrots, onions, potatoes or mushrooms.



© Rafal Meszka

GREEN PEA SOUP

Green pea cream soup is a very fast dish to prepare: boiling peas are drained and mashed with a mixture of other vegetables and herbs, like radish or mint. For a pungent yet special kick, this milder version can be spiced up using strong chilies or tabasco.

ŁUKASZ RAWA



ŁUKASZ RAWA IS AN EDITOR OF THE MAGAZINE "WIADOMOSCI HANDLOWE" ("TRADE NEWS") AND THE WIADOMODCIHANDLOWE.PL NEWS PORTAL. PREVIOUSLY, HE WORKED FOR THE PTWP GROUP AS A PORTALSPOZYWCZY.PL AND "RYNEK SPOZYWCZY" MAGAZINE JOURNALIST.

30 EMPLOYEES



18 VARIETIES ADDED TO THE MENU SINCE THE FACTORY OPENED, WITH 3 NEW VARIETIES TO BE LAUNCHED THIS YEAR.

RESPONSIBLE BUSINESS

In addition to standard vegetables, the Jerónimo Martins Soup Factory in Poland also prevents food waste by using the so called "wonky", irregularly shaped vegetables that have the exact same nutritional value as the standard calibrated ones.

20%

OF UNCALIBRATED VEGETABLES USED IN THE MAKING OF THE SOUPS

IN SEARCH FOR PURPOSE

More than just a professional training, it is a real passport to a life with new opportunities and purpose, a game changer. Project Search plays a decisive role in the inclusion of young people and adults with disabilities. Deeply committed to this cause, Jerónimo Martins has a project in two stores, helping those in need to get prepared for the challenges ahead in the job market.



THE DIFFERENCE THAT COUNTS

THEY head to the city of Braga, in northern Portugal, every morning, hailing to work in the Recheio store. They replenish the shelves in this cash-and-carry business unit, place price tags on products and assist customers. They are young people and adults with special needs and a strong determination to find a steady job led them to Search.

Project Search is a partnership between Jerónimo Martins and Focus – a non-profit organisation specialised in helping people with Autism Spectrum Disorders – and has ties to some similar projects in the USA that inspired it, with the goal of creating jobs for people with disabilities. On-the-job training makes it easier to complete the journey towards a working life for people who have disabilities such as autism, Down Syndrome, cognitive impairment, and other disabilities.

Over the course of their nine-month traineeship, candidates are fully accompanied by a mentor who guides them and supervises how they apply the knowledge acquired during in-store classes. For Joaquim Henriques, it has been an extraordinary experience. He supervises two girls. “They replenish shelves autonomously.



89% of the trainees from the first edition of Project Search were integrated in our Group.

They are always very attentive and very eager to learn”, he says. It is the second time Susana Rodrigues is participating in the project as a mentor, and Paulo and Sara are helping her in the Perishables Department. Susana is pleased to report that they are revealing their potential: “Paulo is extremely curious and a perfectionist. He likes tasks that aren’t very monotonous and repetitive and that stimulate the brain. Sara is diligent, resourceful and works quickly. I don’t think they were expecting to have such an impact on the company, but, in time, they have come to understand that they are part of the family.” Sérgio Costa, a co-worker from the non-food section, takes it a step further: “It’s as if they’re my own children. It’s very rewarding and a benefit to everyone.” Vítor Costa, from the same section, does not spare compliments to his own trainees: “The more I teach Cláudia, the more she wants to learn. She is a perfectionist. And despite his difficulties, Pedro is very curious and helpful.” Some friendships have even blossomed as result of the working relationships. From Recheio’s wine section to Pedro Ferreira’s dinner table, conversation and all the things in common have taken the traineeship to a new dimension: “João and Filipe are practically my neighbours, so I invited them to spend the day at my house and meet my family. They loved it. It was an amazing experience that we’ll definitely be repeating.”

The two trainees are moving on to another three-month traineeship, this time at a Pingo Doce store in Braga. The mentor says he’ll miss them: “It will be difficult when they leave, but I will definitely stay in touch with them.” Vítor adds: “They can count on me, no matter what.”

The good news is that, if their assessment is positive, they may be integrated into the Group, like 89% of the participants of the first edition of Project Search. And for the trainees, what matters is knowing that they are part of something bigger and they’ve earned a purpose in life. In the end, this is the difference between having a real job and being at home without a professional occupation. Susana elaborates: “It’s only after working side by side with these young people that we do understand what they and their parents go through. They suffer tremendously because their children are at home with nothing to do.

Joaquim Henriques helping a trainee. Placing price tags on products is one of the tasks.



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© Gonçalo Delgado



Mentors, trainees and their families posing for a group picture. All of them are pillars of Project Search, as they all feed and benefit from its success.

This exacerbates the problem, because they are unable to develop their skills.” In 2017, there were 12,911 people with disabilities registered within employment centres in Portugal. Only 11% were able to find a job. Pedro Ferreira recalls an episode that highlights the importance of the programme: “During the presentation meeting, there was this mother who said that she asked for help from whoever she could, and we were the only ones who listened.” Because of the role they play in the lives of the participants, their parents and of the impact in the surrounding community, the mentor is a main pillar of Project Search. This has led to the creation of an annual Jerónimo Martins training and “Mentor” recognition event. Susana confesses that she has discovered another calling: “I get emotional talking about this. Whenever I’m allowed to be a mentor, I’ll accept. When I am with them, I also feel more useful to society. It is humanitarian work that I do with an open heart”, she concludes.

AN INCLUSIVE WORKFORCE ON EVERY FRONT @Jerónimo Martins

Project Search is part of Include, a programme run by Jerónimo Martins’ Corporate Employee Relations Department that gives disadvantaged people access to the job market. It has three pillars of action: people exposed to social risk, people with disabilities, and migrants and refugees.



This nine-month job-training programme promotes the necessary skills to get in the labour market.

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DELICIOUS

© Paulo Sgudias

IN DEEP WITH

CORK

In the heart of Portugal, a family company is giving this remarkable material a new twist. Sofalca's unique and sustainable black cork is now filling homes around the world with art. Creative furniture surrounded by high-tech walls are an invitation to sit in nature and call all senses to live a timeless memory.

GO FOR SHOPPING

DELIGHTFUL

A DESIGN FOR LIVES

The falca granules are expanded by the action of water vapour. This “cooking” also gives the resulting cork a dark, chocolate-like colour.



+ feed.jeronimomartins.com

“THE eucalyptus is mine. The cork oak will be my grandson’s.” This Portuguese proverb says a lot about the love of a farmer for his family. “It takes 50 years to get yield from these trees”, explains Paulo Estrada, with whose generation the vision of his grandfather, Ernesto, started to bear the best fruit. Pointing to a particular cork oak, on the beginning of our way to the factory, he helps us with the calculations: “The production phase for this tree will start when the trunk reaches a 70 cm circumference. Then, it can only be harvested every nine years, the time it needs to heal its wounds and regenerate. And the third harvest (amadia) is the first to have the ideal properties for the production of quality corks.”

Having its roots in Abrantes, centre of Portugal, from where the landscape populated with the iconic tree embraces the south until it reaches the Algarve, Paulo’s father and his two brothers decided to set the industrial unit in the municipality, near the train station, and base the company activity on the production of expanded black cork agglomerate for construction’s thermic and acoustic insulation. Their raw material shows how groundbreaking they were at that time: back in 1966, they stuck with the cork that nobody wanted: “In that period, the cork extracted from the upper branches of the cork oak had no value, it was basically used to produce coal.” Its name, falca, was the inspiration behind the Sofalca (being “so” a word game with “só”, meaning “just” in English).

In 1974, a crisis triggered the climb of price of oil products, and the company was once again a pioneer: Sofalca installed the first mixed boiler plant in the cork sector in Portugal, replacing naphtha, as fuel, by biomass: “We had to pay to get rid of the production wastes, and since then, we’ve been transforming them into energy. We are 95% energetically self-sufficient and we have no waste in the factory. All the cork powder is used as biomass and all the grain is sold”, tells the CEO.

The result is a unique and sustainable product exported mainly to Central Europe and Japan, whose difference is promptly revealed before our eyes by its chocolate-like tone. The magic is 100% natural: “When the water vapour passes through the blocs at a temperature of about 400 degrees, it drags the resin, leaving this black coloration. There is no glue, no ink.” The moment calls all senses, tangled up in the smoke. “Those tiny fragments of ember are wood. Wood burns, cork doesn’t, which proves its ability to resist high temperatures.”

Cork oak trees have an average lifespan of approximately 200 years and can be harvested 15 times.



Once stabilized, the blocks are sawn in different thicknesses and packed in order to be placed in different markets.

THE TREE HAS GROWN MORE BRANCHES

Despite Sofalca’s tremendous success, Paulo and his brothers António and Nuno couldn’t escape from their genes. Boldness runs in the family. Besides the business, as well as its values and mission, they inherited the constant need and desire of doing more and better from such an elastic and versatile product. In 2014, the company opened the doors to the design and decoration worlds with the creation of a contemporary furniture brand, Blackcork. The designer and art director Toni Grilo invited the talented new generation of Portuguese designers to develop the first collection of 2014, presented in the professional trade fair Maison et Objet, in France. The second collection was released in 2019. Toni Grilo sees its minimalist, cleansed style as an exercise of exhalation, more than an inspirational one: “I always have lots of ideas, I don’t look for them, it is pretty much the opposite. I have to stop them.” No matter where the fruition drives him, the brand’s backbone remains untouched: “We don’t want it to be trendy; we want it to be timeless. To last. Like cork itself.” ▶

GREEN HEART OF CORK @Jerónimo Martins

Located in the Tejo and Sado river basins, the world’s largest continuous patch of cork oak woodlands spans over half a million hectares. Aiming at promoting its conservation, WWF started the Green Heart of Cork (GHoC) project, that compensates good sustainable farming and forestry practices. Fully committed with protecting the environment, Jerónimo Martins has been supporting this cause since 2013.

Sofalca installed the first mixed boiler plant in the cork sector in Portugal, replacing naphtha, as fuel, by biomass.

GO FOR SHOPPING DELIGHTFUL



In 2015, Sofalca started to explore the symbiosis between its low-tech material with a high-tech process. This mix gave birth to Gencork, which transforms the expand cork agglomerate through generative design algorithms and advanced fabrication processes to add an artistic twist to traditional walls. The brand was born, unbeknownst to Paulo Estrada and his partner in this project, Digitalab, during the Arquiteturas Film Festival: “Sofalca gave the cork for us to develop a creative installation based on computing uses”, tells architect Brimet Silva, from the creative agency. Paulo was dazzled by the outcome: “When I saw that effect, I told them I was already imagining walls and walls timbered with that drawing.” For Brimet, the communion between art and technology ennobled a material that was used to being hidden: “It plays the leading role now. Most of all, we want to create emotions out of it.” He believes “Gencork’s identity is so pronounced that nothing compares to it: we have been visiting fairs in Paris, Belgium, London, and there is something that happens anywhere we go, which is the “wow” factor. It leaves no one indifferent.” The brand has already won international awards, such as the Green Product Award 2016, Les Découvertes Awards, in Maison et Objet in Paris 2016, and the German Design Award 2017. Paulo Estrada says he is pleased to realise that “a product that, during 100 years had no evolution, has gained a new look, a layout able to perform things no one had ever imagined.” As a business man, he resisted the temptation of imposing his ideas to both brand’s professionals: “I rather be infused by their creativity.”

Both the table and the whirl-shaped wall are part of Blackcork and Gencork’s 2019 collection, respectively.



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Besides optimizing cork’s thermal and acoustic properties, this aesthetics also adds artistic value to traditional walls.

This bet on the design market is reflected on the five international prizes Sofalca has already won.



Blackcork and Gencork teams. Paulo Estrada is the first from right to left.

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THE FOURTH GENERATION

“Cork has the ability of evoking memories. Its smell, for instance, someone said it resembled the smell his/her primary school’s walls”, recalls Paulo. “It generates comfort, and lets energy flow. It lets homes breathe, improving the well-being inside.” But there is room for this noble material to grow outside too. That will be the challenge of Sofalca’s next generation: “I think the future will be insulating with art, which also applies to the exterior of buildings. We have some work done in Portugal with cork replacing stone or wood and, ultimately, giving spaces a modern design that can be chosen according to the taste of each owner.” ●



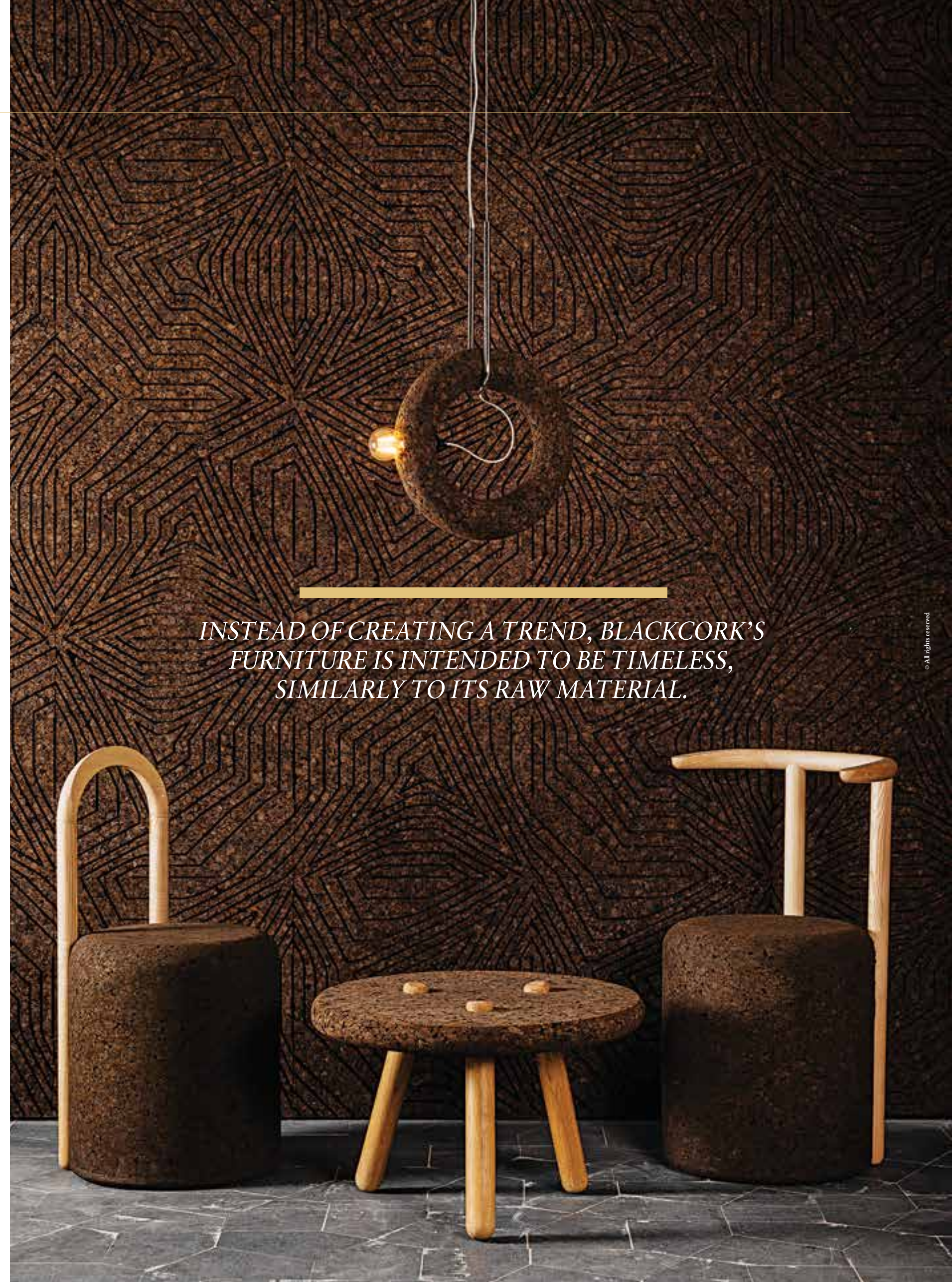
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The minimalist forms are the brand’s main distinctive feature.

GO FOR SHOPPING
DELIGHTFUL



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INSTEAD OF CREATING A TREND, BLACKCORK'S
FURNITURE IS INTENDED TO BE TIMELESS,
SIMILARLY TO ITS RAW MATERIAL.

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GO FOR SHOPPING

DELIGHTFUL

FURNITURE MADE FROM BLACK CORK



© Press Materials - Blackcork

The branches of the cork-oak provide the raw material of Blackcork's (by Sofalca) innovative and sustainable furniture. Made in the centre of Portugal, the chocolate-coloured brand's pieces are a true walk in nature where one can deeply breathe timelessness and sense the charisma of such a noble product. Designer and art director Toni Grilo invited the talented new generation of Portuguese designers to develop the 2019 collection. A selection of irreverent, surprising objects that combine aesthetics and comfort to bring any home a fresh and sophisticated ambiance: table and suspension lamps, tables, chairs, sofas and mirrors.

www.blackcork.pt

AMBER JEWELS



© Press Materials - Amber Matuta

AMBER Matuta's vision is to make luxurious jewellery that expresses the splendour of motherhood and shows off feminine beauty. All the sophisticated creations of this Italian-Polish brand are inspired by the elegance of the goldsmith's art and use precious materials, such as 18 carat gold, diamonds and Baltic amber – a gem formed from resin that has fossilised for forty million years in the subsoil, with tones that range from citrus yellow to dark brown. This fascinating pendant, in 18 carat gold and natural Baltic amber, is part of the ALBA collection and here adorns the elegant figure of Agata Szewiola, Miss Poland 2010.

www.ambermatuta.com



© Press Materials - Nerve Design

DESIGN MADE OUT OF TRASH

At the Nerve Design studio, located in Lisbon's LX Factory, designers, carpenters and artisans take the concept of recycling to a new level. The furniture and decorative items created by this Portuguese brand are made from materials found on beaches, whilst offering an unmatched contemporary and even glamorous feel. Abandoned fishing boats, driftwood, and even metal fittings and windows are reborn in strikingly designed pieces that anyone would be proud to have at home.

www.nervedesign.pt

GO FOR SHOPPING DELIGHTFUL

MADE FROM COFFEE

COLOMBIA

produces 9% of the world's coffee, and Hecho en Café sets out to expand and explore this tradition. All the jewellery and decorative articles produced by this ground-breaking Colombian brand are made from materials produced from coffee grounds. This new use for Colombia's prime raw material is in line with the latest trends in consumer goods and sustainable development, with an impact on communities and the environment.

www.hechoencafe.com



© Press Materials - Hecho en Café



© Press Materials - Qualibet

HANDMADE BACKPACKS

Qualibet's handmade backpacks, inspired by Colombia's Amazonian jungle, are a runaway success. Reflecting the adventurous spirit of its followers, the brand's new collection expresses the trailblazer's dream, combining functional features with a sense of mission.

The motifs reference botanical species that grow in the wild southern wetlands and are fundamental to preserving the balance of this fragile ecosystem: passion flower, açai, rubber plants, cashew and sundew. Qualibet's idea is for travellers to carry a conservation message on their backs. Ideal for short trips in the city and beyond, extremely tear- and damp-proof.

www.qualibet.co

WINE OF THE DEAD

In Boticas,

northern Portugal, the tradition of burying wine dates back to the Napoleonic invasions. The result is known as the Wine of the Dead.

In 1809, when French troops were crossing the region on their way to Porto, the local people rushed to hide everything of value to protect it from the looters. They buried their wine under ground, in cellars, olive presses and other hiding places. After the withdrawals of the Napoleonic armies, they imagined the wine was ruined, but on tasting it they had a pleasant surprise: its properties had changed and its flavour was much improved.

With an alcohol content of between 10 and 11% and slightly sparkling, this straw-coloured wine is made from five grape varieties: Alvarelho and Malvasia Fina (white), Bastardo, Tinta Carvalha and Tinta Coimbra (red). After a six month sojourn under ground, the "wine from beyond the grave" is disinterred in June and brought to the table to cheer the living, more than a century after its discovery.

www.vinhodasmortos.com



© Press Materials - Vinho dos Mortos

THERMAL COSMETICS



© Press Materials - ignae

The secret of a youthful complexion lays hidden in Vale das Furnas, Azores, until it was discovered by Ignae, a 100% Portuguese cosmetics brand which is making itself a worldwide name. Seven years of research and testing have culminated in their first line of five products. The base formula draws its rejuvenating power from the archipelago's natural wonders, combining thermal spring water, volcanic clay, bee stings, honey, Camellia japonica and colostrum (the first milk of a cow after calving). The four complexes – for day, night, eyes and a serum, are joined by the Bee Sting and Clay Mask. The brand uses only tiny quantities of preservatives to ensure the ingredients retain their properties for the product's lifetime.

www.ignae-skincare.com



STILL ROOTS

RUN DEEP

WHAT

happens when a language dies? What is lost, besides a system of signs shared by a community? Thoughts, sounds and gestures fall silent. The laughter, the feelings, emotions and life running through the lost words fall silent too. As if the shutters were closed and the doors bolted on a culture that is closed for ever and lost to the landscape. When a language falls silent, an identity is lost, its soul is no longer felt, its stories are cut off in mid-air. One language dies every fortnight, and with it a particular way of seeing, understanding and interpreting the world.

Of around 7,000 languages spoken on the planet, most used by indigenous peoples, 40% are endangered: only 3% of the world's population speak 96% of all the languages in existence. Without measures designed to tackle this problem, the relentless loss of this intangible wealth will drastically diminish the world's linguistic diversity and with it all the stories, traditions and memories that a language bears within it. The need for a global debate on this issue led the United Nations to proclaim 2019 as the International Year of Indigenous Languages, making the 20th anniversary of the International Mother Language Day. UNESCO, the United Nations Education, Science and Culture Organisation, is responsible for coordinating initiatives and in conjunction with governments, organisations of indigenous peoples, civil society, academic institutions and the public and private sectors, as well as other interested bodies, has planned a year of action to set objectives for this special year. A website features a calendar of events and initiatives related to the 2030 Agenda for Sustainable Development aligned with the Sustainable Development Goals, and is complemented by multimedia resources and areas for joint ventures with partners.

20 YEARS OF MIRANDÊS



© Horacio Villalobos / Getty Images

“Pauliteiros de Miranda”, a traditional dance from Miranda do Douro, Portugal.

In Portugal’s Trás-os-Montes region, two fruit trees mark the border between Terra Fria (Cold Land) and Terra Quente (Warm Land): chestnuts predominate in the former and olive trees in the latter. In the Terra Fria uplands, where the river Douro flows into Portugal, west of the river gorge, lies the Mirandês plain. Long, cold winters alternate with short, hot summers and the landscape of granite, wheat fields and pastures yields a harvest of serenity. In one image: “The azure peace of every creature”, in the words of the region’s poet, Miguel Torga (São Martinho de Anta, 12 August 1907 – Coimbra, 17 January 1995). In this place Torga himself dubbed “Marvellous Kingdom”, the signposts welcome us in two languages: Portuguese and Mirandês. The latter became the country’s third official language in 1999, shortly after the recognition of Portuguese Sign Language in the Constitution of Portugal. This simple language, kept alive by oral tradition and originally used in the everyday lives of farmers and shepherds, has been enshrined in law now for two decades. There has been no precise survey of the number of speakers of Mirandês but it is estimated at 50,000, in the municipalities of Miranda do Douro (except in the villages of Atenor and Teixeira) and Vimioso (the villages of Vilar Seco, Angueira and Caçarelhos). It is spoken above all by older generations although young people have the option of learning it at school in Miranda: the language was introduced as an optional subject in 1986/1987. The project started with nine students in the second cycle (10-12 year-olds); today 386 students take the language lessons, from year one to year 12, representing 63% of the student population. 386, and not “around 400”, because each student counts and, in the battle to preserve this indigenous language, each one is important. Together with the population drain from the region, demographic ageing and the low birth rate mean that the future of Mirandês is far from certain.

ORIGINS

Mirandês belongs to the Asturleonese family of languages, whose origins date back to the Romance languages that formed in the Iberian Peninsula from Latin roots. In the 6th to 8th centuries, the whole region was part of the Roman Empire and inhabited by the Asture peoples. This was the tribe of Zoelas or Zelas, whose home was the region we know today as Terra de Miranda. Asturleonese was the language spoken in the kingdom of Leon from its earliest days, except in the Galician-Portuguese area. It was the language of the court and monasteries, used in thousands of written documents until the 13th and 14th centuries. Teresa of Leon and her son Afonso Henriques, the first king of Portugal, were also speakers of Leonese. With the founding of the town of Miranda, in 1289, and especially from the 16th century onwards, when Miranda do Douro was elevated to city status (1545), Mirandês evolved into a particular variety of this group of languages. Until the late 19th century, Mirandês was a language which existed only in its natural, spoken state. The turning point came when, in 1882, the linguist and philologist, José Leite de Vasconcelos wrote, in his work “Dialecto Mirandês”, that “Portuguese is not the only language spoken in Portugal”. By giving this public recognition, he prompted a series of studies into the language that, a century later, culminated in the language lessons at the preparatory school in Miranda do Douro (this had not been possible under the authoritarian Estado Novo regime, which repressed the Mirandês as “poorly spoken” Portuguese) and later in the drafting of the Orthographic Convention, in 1999. In the same year, legislation was passed officially recognising Mirandês as a regional language of Portugal, putting an end to centuries of isolation. To mark the date on which the Portuguese parliament unanimously approved the language’s official status, the 17th of September was proclaimed Official Mirandês Language Day.

Today 63% of the student population in Miranda do Douro take language lessons of Mirandês



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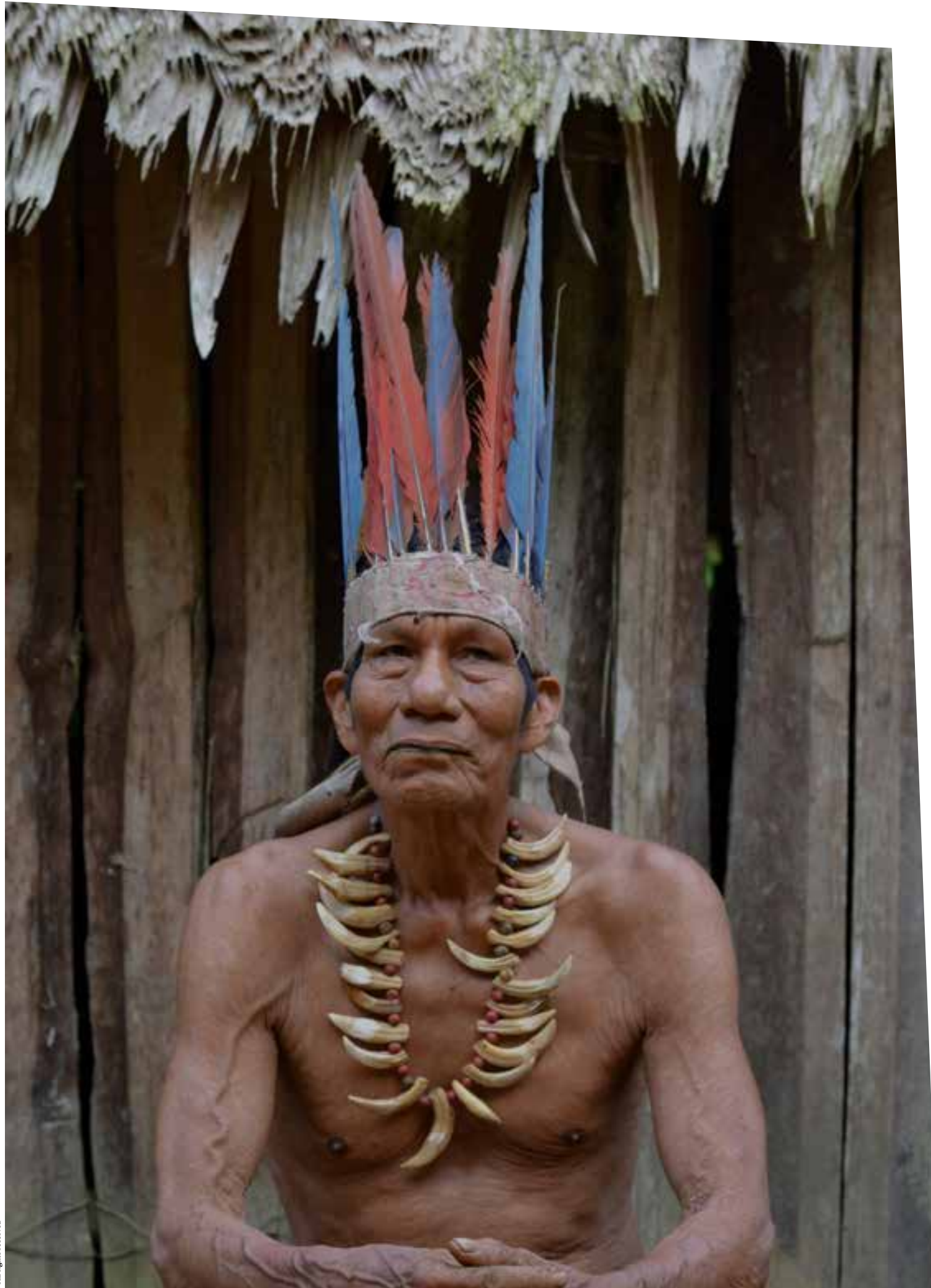
“The Little Prince” (“Le Petit Prince”) by Antoine de Saint-Exupéry translated to Mirandês: “L. Princepico”.



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MAIN ACHIEVEMENTS

This process marks a new period in its history, which goes from education to culture, also embracing the press. Jornal Nordeste, one of the most important newspapers in the region of Trás-os-Montes, started to include a supplement with news in Mirandês. In 2004, the largest online free encyclopedia became available in the Mirandese language with Biquipédia’s launch. In literature, the translation of the greatest Portuguese epic poem, “Os Lusíadas”, in 2010, which took 18 years to complete, as well as that of Fernando Pessoa’s “Message” (2011) are worth mentioning. Later, also Saint-Exupéry’s iconic masterpiece, “The Little Prince”, and the adventures of Asterix and Obelix began to speak Mirandês. In Casa de Trás-os-Montes, in Lisbon, a course is taught after working hours. In the city of Oporto, Scuola Mirandesa d l Porto was born three years ago.



COLOMBIA'S INDIGENOUS LANGUAGES

**HORTENSIA
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COLOMBIA stands out with its diverse flora, fauna, languages and cultures. This is a multilingual and pluricultural country with 65 indigenous languages, 2 creole languages, 1 Romani or Gipsy tongue, 1 sign language, in addition to Spanish. The latter is the dominating and official language throughout the Colombian territory, imposed by colonizers starting on the 15th Century. Indigenous groups inhabited this territory since millennial times; they were plentiful upon the European colonization and were gradually exterminated and displaced to the country's periphery. Currently, there are only close to 80 indigenous communities left, including the ones that do not speak their native language. From the 65 existing indigenous languages, 57 are classified within 13 linguistic families and 8 are unclassified or are mono-typical.

From these languages, 11 are in a vulnerable state, 28 endangered, 12 in serious danger and 13 in critical situation. One of the main threats is its disadvantageous situation compared to Spanish, which is the hegemonic language and the language used in communications, in the media and in formal education. Indigenous languages have been relegated to a second place and teaching them or learning them is no longer necessary. The displacement over the past few decades is also an important factor, sometimes triggered by the serious public order situation or from the need to seek educational and work opportunities to combat poverty, underdevelopment and abandonment. It's worth noting that Colombia has developed important legislation aimed at recognizing and valuing native people, languages and cultures. Starting from the 1991 Constitution and several Bills, the indigenous languages began to be recognized as official in their respective territories and Colombians began to view these people and their tongues with greater interest and respect. Currently, some entities and people contribute to programs aimed at formation, research and promulgation of indigenous languages. Progress has been made in knowledge, revitalization and documentation of several languages, supported by indigenous literature and orality programs. There is also a group of indigenous writers that are starting to become recognized at a national and international level, nevertheless, greater financial support is needed to expand the programs planned and being implemented given that tongues and cultures are priority issues for society. Avoiding the extinction of the intangible wealth in the form of tongues and cultures is a task that falls on all of us, given that these do not belong only to the native people and Colombians, but to all human kind; the disappearance of a native tongue includes the disappearance of valuable ancestral knowledge on flora, fauna, medicine, culinary costumes and social organization that have been developed during thousands of years. Current societies are in constant movement and different countries house people from different parts of the planet, demanding the development of a multi-cultural vision. It is not too late to avoid the loss of these tongues and to protect native populations that are also the main care-takers of mother earth, the pantry from which all inhabitants in this planet feed from.

¹ Populations Office in Colombia's Ministry of Culture.

THE KASHUBIAN LANGUAGE IS STILL ALIVE BUT IN DANGER



Man taking snuff from traditional Kashubian snuff box made of cow horn during Kashubian Unity Day, celebrated every March 19 in Chmielno, Kashubia region, Poland.

POLAND

is one of the most linguistically homogeneous European countries, with nearly 97% of Poland's citizens declaring to speak Polish. There is only one language except the dominant Polish, and it's Kashubian. In 2005, The Act on National and Ethnic Minorities and on Regional Languages qualified the Kashubian language as a regional one.

There are more than half a million Kashubians, from whom up to 100 thousand declare to use the language daily. Where do they live? The heart of Kashubia (Polish: Kaszuby, Kashubian: Kaszëbë) beats among the picturesque lakes of the Kashubian Lake District situated in the north of Poland, dotted with upwards of 700 lakes. The region stretches around 120 km to the south from the Baltic Shore. The Kashubian population are descendants of the former Baltic Slavs, who lived in Pomerania from the Middle Ages. Kashubia has been under many rules throughout its history – Swedish, Danish, Knights of the Teutonic Order, French, Prussian and German, until 1454, when the entire Kashubian territory was incorporated into Poland. The capital of the Kashubia is the city of Gdansk.

FROM THE DIALECT TO A SEPARATE REGIONAL LANGUAGE

Kashubians are mostly bilingual. In the past, they were even trilingual: they spoke Kashubian at home, they prayed in Polish when at the church, and used German in schools and offices. Kashubian language is a West Slavic language in the same family as the Czech, Polish, Upper Sorbian, Lower Sorbian & Slovakian. The vocabulary is heavily influenced by German and Polish and uses the Latin alphabet. At the beginning of the 20th century the eminent German historian and an authority in linguistics, Friedrich Lorentz, distinguished 76 Kashubian dialects. In 2005, after the Polish parliament had enacted the law on ethnical and national minorities and regional languages, Kashubian was granted the official status of a regional language. It is the only language in Poland with this status. The act has improved the sociolinguistic situation of Kashubs making many of them proud of the status change of their native language. Today the Kashubian language is present in the local media, churches, schools and offices. The number of children attending Kashubian lessons was approximately 17 thousand in 2014. The University of Gdansk educates Kashubian teachers at a 3-semester studies, and 83 students have earned a postgraduate diploma in teaching Kashubian.



Aerial view of the Wdzydze lake in Wdzydze Kiszewskie, Kashubia region, Poland.

In 2005, Kashubian was granted the official status of a regional language

PASSING THE KASHUBIAN FROM ONE GENERATION TO THE NEXT

Some note that Kashubian needs to combat the stigma of being the language of the countryside, of simple, uneducated people from the rural areas. Nicole Dołowy-Rybińska has done sociolinguistic research on young Kashubs (aged 16-25) and highlights that many of them have a passive knowledge of Kashubian and abandon it in favor of Polish, recognized generally as the more prestigious speech. “Many young people admitted that they treated Kashubian for a long time not as a language of everyday communication but as a language of jokes, games, and also a language that seems to be ridiculous to children”, she said. Luckily for this ancient language, there are more than 12 active organizations promoting Kashubian culture in Poland, in order to build the bridge between different Kashubian generations.



Kashubian school interior in Kashubian Ethnographic Park, in the small village of Wdzydze Kiszewskie, Kashubia region, Poland.



sounds

FROM
THE DEEP

There are universes that transcend the senses, inhabited by sounds beyond the range of normal hearing. These are deep habitats where sound waves take on a vital role in the communication and survival of some species in the animal kingdom.



Elephants use infrasound with a scope of two kilometres to communicate over long distances.

NATURE'S FREQUENCIES

OUR mapping of the world is limited to the capacity of the senses and, in terms of hearing, human sensorial perception is completely ineffective for detecting the entire spectrum of sounds on the planet. There is a whole universe of deeper sounds that are beyond the scope of the human ear, equipped to detect frequencies between 20 Hz (more low-pitched) and 20 kHz (more high-pitched). This means that infrasound, all low frequencies below 20 Hz, and ultrasound, above 20 kHz, remain inaccessible to the human ear. But it is our very nature that drives us to find solutions so that we can closely study the habitat we live in.

We now know that the amplitude of sound waves is much greater than what we can hear, because we were capable of developing sensitive technology to detect it. This gave us the ability to listen more carefully to the nature that surrounds us and has allowed us to narrow the border that separates us from inaudible sounds. Some echo very closely, on the surface, but still at an unattainable frequency, while others echo in the depths of the earth and of the ocean.

Nature has its own ways of enabling communication in and between species in very adverse situations

DEEP SOUNDS ON THE SURFACE

At first glance, nobody would say that the largest land mammal, whose trumpeting is clearly audible, uses infrasound with a scope of two kilometres to communicate over long distances. But these waves below the audible spectrum are a privileged communications channel, not only for elephants – which can pick them up through their feet – but for many species in the animal kingdom, particularly mammals.

Researchers believe that some of the most fearsome predators use infrasound to paralyse their prey. This is the case of the roar of tigers, experienced a little too closely by Mel Sunquist, a professor in the Department of Wildlife Ecology and Conservation at the University of Florida, and his wife, Fiona Sunquist, authors of books such as *Wild Cats of the World*. They survived the scare, but their memory of how they felt paralysed will stay with them forever: “It feels like the sound is actually penetrating you. It’s so forceful. My wife said she felt like she couldn’t move. She felt like she was sort of frozen.”

Ultrasound, on the other hand, can be used for baby rodents and kittens to communicate with their mothers and avoid predators. However, the first non-mammal species on record for using frequencies above 20 kHz is the *Amolops Tormotus* frog. This amphibian, whose ears sit at the edge of its face, has visible ear canals that lead to a sunken eardrum within the skull, allowing the ultrasounds transmission.

This is how they hear over the sound of the waterfalls where they live, in the Huangshan Mountains in Eastern China. “Nature has a way of evolving mechanisms to facilitate communication in very adverse situations”, says Albert Feng, in charge of the research into this discovery published in *Nature* magazine. The professor at the University of Illinois in the USA, a reputed neuroscientist specialising in hearing who studies frogs and bats explains that “one of the ways is to shift the frequencies beyond the spectrum of background noise. Mammals such as bats, whales and dolphins do this, and use ultrasound for their sonar system and communication. Frogs were never taken into consideration for being able to do this.”





Echolocation allows bats to detect obstacles in flight, find their way into roosts and forage for food.

ECHOLLOCATION

The echolocation or biosonar system is an innate biological ability which is particularly crucial to the survival of some mammals. The emission of ultrasound waves – in the air or in the sea – makes it possible to detect the position of and the distance to obstacles, analysing the time between the moment when they are emitted until they come back in the form of a reflected echo. In other words, the faster the sound comes back, the closer the obstacle is.

It is this ability that allows bats to fly at night, compensating for their poor night vision. It is also very useful for them to catch their prey. The ultrasound produced by dolphins and whales, a mixture of clicks and whistles, serves not only for these cetaceans to communicate with each other, but also for navigating murky waters and finding food.



Bats and marine mammals are able to use sound to “see”

SOUNDS FROM THE DEPTHS

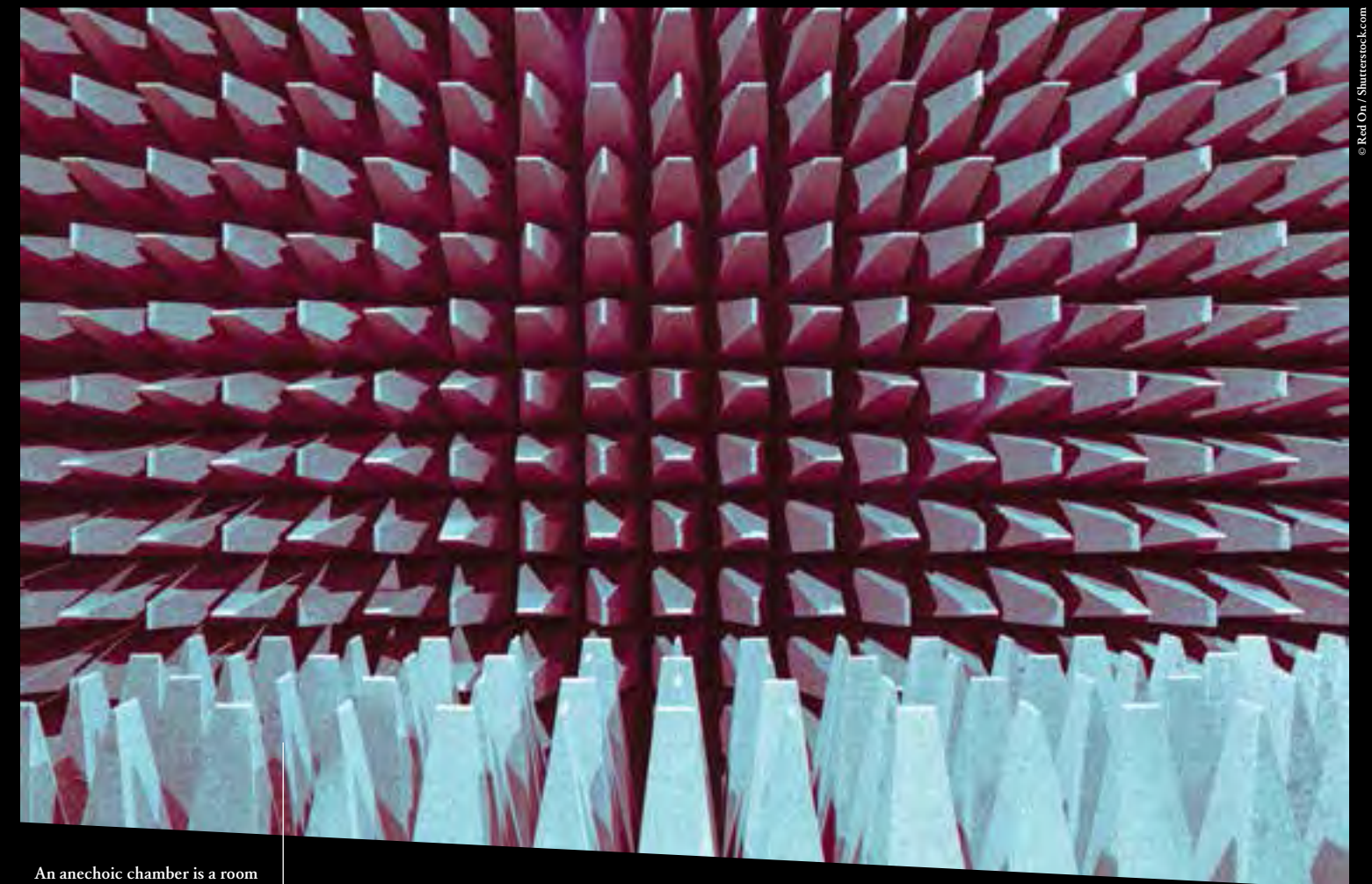
In deep muddy burrows in the ocean, Mantis Shrimps (stomatopods) have a communication method that uses very low frequency sounds, between 0.02 and 0.06 kHz – called rumbles – which they use when interacting with potential predators. Apparently, the sound is emanated through the vibration of muscles on the shell which, at a certain point, becomes bright pink in colour. This characteristic seems to indicate that the species has a very complex system of interactions.

This species generates tonal, low frequency sounds that are spectrally similar to those produced by African and Asian elephants.

The absence of noise is something human beings, who didn't evolve in a world of silence, just can't stand for too long

THE MOST QUIET PLACE ON EARTH: DEEP SILENCE

It is the deepest possible silence one can experience. Anyone who has ever tried it says that diving into this absence of noise is profoundly intriguing. The sound of silence. A sensation only possible in anechoic chambers, rooms designed to completely absorb both noise and electromagnetic waves. There are no echoes in there and, as soon as someone speaks, all sounds are absorbed. That is something human beings, who didn't evolve in a world of silence, just can't stand for too long. The Instituto Superior Técnico in Portugal has one of these chambers. It is lined with foam wedges to cut off frequencies of 80 Hz and is used for acoustic trials in the wind tunnel at the Institute's Aerospace Laboratory. The truth is that after 45 minutes most people begin to feel ill and disorientated, not so much because of the absolute lack of reverberation, but because all the senses become sharper: breathing, scratching, swallowing or even the heartbeat are sounds that take on an unexpected intensity in this controlled environment. By comparison, one of the quietest sounds that can be heard in a quiet room clocks in at 10dB. Therefore, this surely is the quietest place on Earth.



An anechoic chamber is a room designed to completely absorb reflections of either sound or electromagnetic waves.

A THOUSAND MINES

Mining for stories and opportunities in Portugal, Poland and Colombia is to pluck from the bowels of the Earth an incredible repertoire of glories, conquests, traditions, beliefs and ideas of what this world below can still bring to the surface.

LITHIUM, THE NEW WHITE GOLD



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Discovered by Johan August in 1817, lithium is a soft metal with a density close to half that of water. It is solid, silver in colour, and turns grey when exposed to air.

THE 20th century was the age of oil. This century is the age of lithium. In 20 years' time, the internal combustion engine will be relegated to history. Electric batteries will take the place of diesel and petrol. The energy revolution in the automotive sector has made lithium the metal of the future. Although it has long been part of our lives. Production of lithium and related compounds grew significantly after World War Two. But only became the new gold with the popularisation of its use in psychiatry and, more recently, with the arrival of mobile electronic devices.

Today, some three million cars are driven silently on the roads of Europe. By 2030 the International Energy Agency predicts there will be 125 million electric vehicles. The dizzying increase in global demand for lithium has caused output to shoot up, with a growth of 13% at the end of 2017 (the latest official figures available), to 43 thousand tonnes. The average price of lithium carbonate, the chemical base produced by the industry, has kept pace with this trend, and currently stands at 13,900 US dollars a tonne. Australia and Chile account for more than half of the output, in a list in which Portugal comes in 6th place, producing 400 tonnes a year. Most of this comes from the aplite-pegmatite deposits of Yellow Gravel, in Gonçalo, district of Guarda, Portugal. Not a vast quantity perhaps, when compared with those at the top of the league table, but this belies the wealth concealed beneath our feet, and now on the radar of several international companies: Portugal has the 6th largest reserves of lithium in the world, although the concentration is lower. According to a survey by Portugal's National Engineering and Geology Laboratory, the deposits total 60 thousand tonnes, spread between 11 areas where the planet's lightest metal can be profitably mined, most of them north of the Tagus river. Up to 2025, the most significant growth (15%) will be in manufacturing batteries.



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Lithium was first isolated by chemists William Thomas Brande (1788-1866) and Sir Humphry Davy (1778-1829) using electrolysis methods. This picture is an impression of Davy testing his miner's safety lamp. From Edwin Hodder Heroes of Britain, London c1880. Wood engraving.

Portugal has the 6th largest reserves of lithium in the world. The deposits total 60 thousand tonnes, mostly spread north of the Tagus river

At present, Portuguese lithium is mostly used in ceramics, because of the cost and difficulty of obtaining lithium carbonate from the country's reserves. In Portugal, it has to be dissolved and ground down, in contrast to the process in the salt lakes of South America. There, the extraction process is similar to that for sea salt: water is pumped into evaporation tanks and then transformed into carbonate by electrolysis, purified and sold to the market. This difference prompted a team of researchers at two Portuguese institutions (the Instituto Superior Técnico (IST) and the National Laboratory of Energy and Geology (LNEG)) to develop a simplified and more efficient and economic method for processing the lithium ore mined in Portugal.

This method, which has caught the eye of mining industry technicians in Southern Africa and Australia, as well as academics, has been designed to recover more than 90% of the lithium found in lepidolite, in the form of lithium carbonate, using a new type of grinding that causes mechanical activation, and offering an alternative to calcination of the mineral. This technique would make it possible to avoid using energy and the consequent high costs associated with the high temperatures needed for the traditional method (in calcination, these can be as high as 900 °C to 1100 °C, and are substituted by a maximum temperature of 150 °C in the acid digestion phase), making the country's lithium business more attractive and competitive.



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The lithium minerals occurring in Portugal have been used on ceramics materials, helping the industrial melting process, and added value for the production of ceramic pastes.

THE HEAT IS ON

Committed to positioning Portugal at the centre of the value chain, the Lisbon-based Government is putting the final touches to an international call for tenders for prospecting, exploration and mining of lithium in the country. The contract specifications and invitation for tenders are ready for installation of a processing unit. In March 2017, a report from the government indicated that 23 licensing applications had been received “involving investment of 3,254.40 million euros”, over a total area of 2,500 km². The automotive sector and manufacturers of batteries for storing power generated by domestic solar panels are the most attractive markets for a country eager to be at the forefront of the clean energy revolution. By mid 2019 some ventures were already under way: in Sepeda, Montalegre (district of Vila Real), and in Covas do Barroso, Boticas (in the same district). In both cases, the mining concessions involve Australian companies and were awaiting the completion of the Environmental Impact Study (EIS). The first of these ventures also envisages the construction of 10 kilometres of walkways across the concession area, to show tourists how lithium is mined and processed, with guided tours in mining and industrial areas.

The automotive sector and manufacturers of batteries for storing power are regarded as the most attractive markets



A number of ventures are already under way, in the northwestern region of Portugal.

LOST GREEN WORLD



SIXTY-SIX million years ago, in an enchanted place, earth and water combined in an unrivalled alchemy to crystallize in a legendary precious stone. Colombian emeralds are unique, not just in their exceptional beauty and luminosity, but also in the process of their formation, different from emeralds in other regions of the world. Today we know that saline fluids were released as a result of tectonic movements and flowed along the geological faults, bringing them into contact with evaporites, sedimentary rocks comprising more than 50% salts deposited by evaporation. This mineralised into the green magician “embrujo verde”, in Spanish. In other countries, such as Nigeria, emeralds formed from the interaction between magmatic fluids and intrusive rocks, formed from the slow cooling of magma. In the region which is today Colombia, the Muiscas were the pre-Hispanic society which knew the most about emeralds. Between 400 and 1600 A.D., these tribes lived in the modern administrative districts of Cundinamarca and Boyacá, in the central Andes, and the largest concentration of these peoples was in the plateaux around Bogotá. This was the region with the richest emerald reserves, of which only 1% are said to have been mined. It is doubtful whether the Muiscas were aware of the true scale of the treasure beneath their feet.

Like other indigenous peoples in South America, they believed that life was divided into three dimensions, the underworld, the underworld and the world. Mankind was in the last of these. The underworld, a place of rebirth, was green and, for the Muisca, this was the colour of fertility and of the power of their own existence. In those times, when they bore their way into the bowels of the earth, they believed nature could not simply give them the treasures that had taken millennia to form without asking anything in return. So, these people used offerings as a way of giving back and restoring the balance disturbed by the gift. Emeralds were one of the many objects deposited during the rituals of birth, marriage, death and many others, in sacred places: lagoons, caves, rocks, fields, mountain tops and temples known as “cucas”. The festivities included communal feasting, singing and dancing. It is also known that other cultures, such as the Calima, what is today Valle de Cauca, the Zenú, from Córdoba, and Tumaco-La Tolita, from the Pacific, used emeralds to fashion jewels and adornments that they offered to their gods and used to venerate their chiefs. They learned to cut and work the stones in order to place them in gold chains, for example. Given that none of these tribes travelled anywhere near a deposit, archaeologists and anthropologists have concluded that the stones were also used as a form of currency.

When, in the 16th century, the Spanish reached the Cundiboyacense plateau, in the Eastern chain of the Andes, they found a populous region, where the society had a clear hierarchy, living in villages scattered on the mountainsides and valleys. Also organised into cacicazgos, the Muisca farmed corn, potatoes and other tubers, allowing them to support their priests (“jeques”) and goldsmiths. This self-sufficient economy was also based on production of ceramics, jewellery and textiles, as well as salt and emerald mining. Served by an extensive mercantile network, this civilisation traded these products for cotton, gold, feathers, beeswax, honey and tropical fruit.



© Anya Goodkhan / Getty Images

Gonzalo Jiménez de Quesada, 1506 – 1579. Spanish explorer and conquistador in Colombia. From La Ilustración Española y Americana, 1892



© Universal History Archive / Getty Images

Led by Gonzalo Jiménez de Quesada (Granada or Cordoba, Spain, 1509 – Mariquita, Tolima, Spanish Empire, 16 February 1579), the colonising troops encountered the precious stones on their quest for El Dorado, the mythical city of gold lost in the South American jungle that haunted the imagination of conquerors and adventurers for close to five hundred years. The Spanish Empire used the emeralds, like the gold, as a means of financing their expeditions. The indigenous peoples were reduced to labourers for the Crown, which enslaved them and forced them from their homes to work in the mines. In just 50 years, the native population was reduced to 35% of its original numbers. It is believed that, a few years before his death, Jiménez de Quesada corresponded with the Spanish monarch, Felipe II. In one of these letters, he appears to have asked the king to hand over the operation of the emerald mines exclusively to the native peoples. In order to show what they were capable of doing, he told him that they only mined the stones in winter, as the rain sent channels of water that washed the soil and helped to uncover the seams of emeralds. In a book entitled “Építome de la conquista del Nuevo Reino de Granada” (1889), by an unknown author and attributed to the Spanish conquistador and founder of Bogotá, we find a clearer idea of why “no one else knew how to mine the emeralds”: “They partake of certain herbs with which they say they know which veins have the largest and most beautiful stones. Indians from anywhere else, such as those from outside the fiefdom of Somindoco, who is the chieftain and lord of the mines, cannot go there in search of emeralds nor do they venture to look upon the mines, because they will die within one moon, in a month or thirty days.”

The Muisca were the pre-Hispanic society which knew the most about emeralds

A FABLED GLOW

In the past, the unexplained origin of emeralds incited the human imagination to find legends to explain this wonder and countless numbers of these are today part of our universal mythology. One of them, the Fura-Tena legend, also explains the beginnings of mankind. The god Are, who governed the destinies of the Earth, decided to create a species to inhabit it. From the banks of a mighty river, he took two long reeds and, with his divine breath, transformed them into a man (Tena) and a woman (Fura). They would always be happy and never know pain or death, but on one condition: that they were faithful to each other. One day, a fair youth called Zerbi asked Fura to help him to find a famous green stone. She agreed, but they searched several days in vain. Fura then fell in love with Zerbi, and betrayed Tena. On an impulse, Tena decided to end his life, ripping his chest open to the horror of the repentant Fura. On the wishes of Are, precious sun-kissed emeralds grew from her tears.

In the Colombian municipalities of San Pablo de Borbur, Pauna and Muzo, in the district of Boyacá, we may find two hills named after the main characters in this legend. Fura and Tena, once a place of worship for the Muzo Indians believed to be the seat of their gods and used as sacrificial alters, rise up from the landscape to heights of 840 and 500 metres. The calm waters of the river Minero Guaquimay flow with sudden fury into a narrow and deep gorge between the two hills. As in the legend.

The names of Fura and Tena were also given to the largest known Colombian emeralds, presented to the public in 2011, 12 years after they were found, side by side, in a mine in Muzo. Fura weighs 2.2 kilogrammes and has 11 thousand carats, and Tena 400 grammes and 2 thousand carats. Only 11 people have had the privilege of seeing the two precious stones at Minergemas, the mining and precious stones and minerals fair in Bogotá.

HISTORY KEEPS SHINING

Coveted for their colour, size and transparency, Colombian emeralds attract buyers from all over the world, with China, Thailand and India as the main export destinations. In 2018, Colombia established itself as the leader in the “green war”, beating its main competitors, Brazil and Zambia, with a turnover of more than 142 million dollars (despite its output trailing in only third place). The bulk of this business relates to exports of cut emeralds (249,788 units, with a value of 122 million dollars), followed by uncut stone (at 19 million), according to the Colombian emerald sector association (Fedesmeraldas). The department of Boyacá accounts for 99% of the country’s output, with 1,332 mining licenses, headed by the municipalities of Maripí, San Pablo de Borbur and Muzo. The industry generates direct employment for 3,000 workers and indirect employment for a further 12 million. These figures have allowed the sector to invest in social projects in their local areas. As a result, Fedesmeraldas, in partnership with a series of public and private bodies, committed itself to investing around 11 million pesos (3.5 million dollars) in building a hospital in the municipality of Muzo. The building work is set to start at the end of 2019. This is the beginning of a new era in the history of a major national symbol.

The legend of Fura and Tena was created to explain the origin of the Colombian emeralds.



Known as “La Lechuga” (the lettuce) due to the intense green generated by 1,486 emeralds, the Monstrance from the Church of Saint Ignatius of Bogotá is considered a baroque jewel of Colombian art and was exhibited in Portugal in 2017.

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POLAND'S BLACK GOLD



Coal mine in south of Poland.

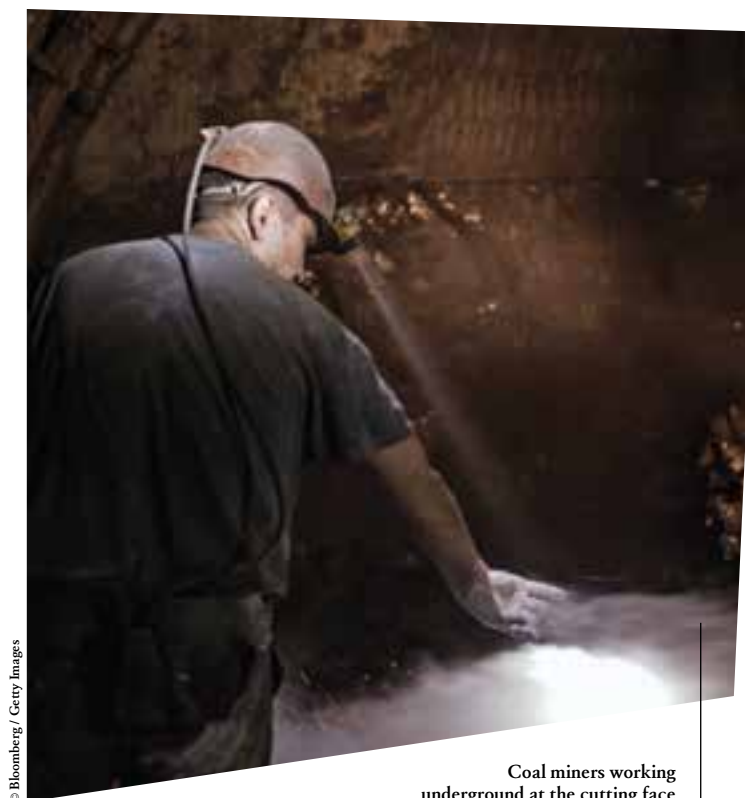
COAL mining has a long tradition in Poland and played a crucial role in the country's development. The "black gold" powered the nation's industrialization and helped it achieve energy independence. And today it still dominates Poland's energy mix, delivering 81% of the electricity and 86% of the heat. In the case of electricity generation, the two other most important sources are wind (7%) and biomass (6%), whose numbers give a clear idea of coal's strategic importance for the country. No other EU member burns more hard coal, and only Germany and Turkey burn more lignite. According to the European Association for Coal and Lignite (EUROCOAL), the country produced 63.4 million tonnes of hard coal and 58.5 million tonnes of lignite in 2017 (latest data available).

"King Coal" was used from the Middle Ages onward, initially on a small scale due to cheap and easily available wood. The history of its extraction in the present-day Polish territory dates back to the 18 century, where first mines were operated in the Lesser Poland, Upper Silesia and Lower Silesia regions. The first permanent coal mine in Poland was established in Szczakowa (Lesser Poland) in 1767.

In the 19th century this fossil fuel became the main driver of regional growth, promoting the development of transport as well as the use of steam engines and electrification, both in industry and in the residential sector. And around the emerging industrial centres, urbanization flourished. Also underpinned by the escalation of social rights and workers' movements, this rapid progress shaped a new cultural identity with a strong work ethos. These factors together led to the foundation of the image of coal mining as the engine and symbol of the nation's prosperity.

In the 20th century, Poland established a strong position among the world's coal-producing countries. Exports became an increasingly significant source of national income: around a third of hard coal production was exported in 1950, mainly to the communist bloc countries. In the post-WW2 period, the "black gold" had enabled Poland to rebuild its economy, for which it is easy to understand why it was framed not only as a source of national pride but also of survival. That imaginary was expressed by persuasive slogans – such as "Long Live the Mining State" and "Poland Stands on Coal", disseminated in public speeches. The production of coal reached its peak in 1979 at 201 million tonnes (42 million were exported).

Since democratization processes unfolded in 1990s, the Polish mining industry has been going through a process of transformation to reduce excess coal production capacity and adapt the industry to the shift from central planning to the free market. By that time, production of hard coal was decreasing rapidly, primarily in response to decreasing demand from restructured and modernised industry. Even though its output has declined during the past twenty years, Poland is still one of the world's major coal producers (the ninth-largest worldwide). The industry currently generates approximately 100 thousand direct jobs.



Coal miners working underground at the cutting face in the Piniówek coal mine, in Pawlowice, southern Poland.

MORE THAN AN AFFAIR

A deeper look reveals that the country's commitment to coal also lies in historical and cultural, if not emotional, aspects. "King Coal" truly holds a special place in the nation's collective heart. A ranking of the most respected professions published by Poland's Public Opinion Research Center (CBOS) in 2016, lists miners on its top: they are respected at levels (82%) comparable to university professors (80%) and more than medical doctors (74%) or teachers (71%). One of the most celebrated days associated with workers group is St. Barbara's Day on December 4th (St. Barbara is the patron saint of miners). Miners from coal-mines of Silesia and Zagłębie don't work underground during "Barbórka" so they can participate in festivities with their families. Those include a Holy Mass, followed by a procession, concerts, artistic performances, games and balls.



Poland plans to reach a 21% share of renewable energy in the final energy consumption in 2030. A special role will be played by offshore wind farms.

BLACK GOES GREEN

The issue of Polish coal transition is increasingly on the political agenda in the context of EU long term strategy for reducing emissions in the scope of the global greenhouse gas effect reduction targets established by the Paris agreement. According to Poland's draft energy policy, coal will remain the country's primary energy source in the nearest decades, although the nation's energy mix is expected to become more diversified. By 2030, it is estimated that coal will still account for 60% in electricity generation, being the demand covered by domestic sources solely. Renewable energy sources will have a share of 21% in final energy consumption. Released in November 2018, the strategic document titled "Energy Policy in Poland until 2040" also envisages the construction of the first nuclear power plant planned for 2033 with a capacity of 1-1.5 GW. Up to six reactors, with a combined capacity of 6-9 GW, would be put into operation by 2043. With the growth of energy generation from low-carbon sources in mind, the nation commits to achieve a 50% reduction of CO² emissions in the electricity sector by 2040.

DEEP UNDERGROUND

Modern-day tourists are no longer satisfied with ticking another destination off the map. They crave distinct challenges, with a taste of adventure – in other words, they seek experiences. As a result, tourism has been evolving in entirely new and often surprising directions. And one of them points directly downwards.

WHAT'S

hidden beneath our feet is inextricably linked to the history of civilisation: from evidence of first human settlements to resources mining and strategic and military structures. Hibernating deep underground, in complete darkness and silence, these attractions offer a unique experience. Underground travel is a journey back in time and through a world of mystery, legend, history and the unknown. Poland has an amazing abundance and variety of underground sites. Each year, over 5 million people from all over the world visit Poland's adits, cellars, dungeons and mines on over 200 underground routes. Curiously enough, today's tourism offer includes services far beyond the standard, conventional sightseeing of "must see" locations. There are underground simulations of historical events, facilities to organise integrated events, go on a boat trip, have photo sessions, stay the night and even organise a wedding ceremony and party. Surprisingly, this accommodating of the needs of tourists and the introduction of numerous conveniences and facilities has not put a damper on the wealth of excitement and emotions brought on by the mere fact of going and staying underground.

The 500 metres route runs along corridors carved in bare rock with smaller passages branching out of the bunker

UNDERGROUND SIGHTSEEING ROUTE AT THE KSIAZ CASTLE

The underground area of Książ Castle is without a doubt one of the most intriguing subterranean destinations in Poland. Surrounded by tales and legends of the "Nazi Gold Train", treasure chests, hidden chambers and even an underground train station, it is a real treat for any mystery and riddle lover. During World War II, there were plans to turn the castle into Adolf Hitler's Headquarters. Tunnels and chambers created in that period were to provide shelter and accommodation for Nazi dignitaries and visitors to the castle. We know from salvaged documents and witness accounts that work was carried out to adapt the rooms for these purposes. The underground excavations were carried out at a depth of 50 metres below the courtyard surface. This was the depth required to provide safety from air rides.

Książ Castle's underground area is a new destination on the map of subterranean thrills - it was open to the public as late as 2018. The 500-metres route runs along corridors carved in bare rock with smaller passages branching out of the bunker and crosses a gigantic concreted hall.

The underground spaces were concreted over using special Portland cement. Available documentation estimates that the tunnels cover an area twice the size of that known today, i.e. 3200 m².



© JANEK SKARZYŃSKI / Getty Images

SILVER MINE IN TARNOWSKIE GÓRY

This is the only place in Poland that allows public access to a historic silver ore mine set in the Triassic dolomites and limestones.

In the 15th century, abundant deposits of silver and lead ore were discovered around the town of Tarnów. The following century saw the establishment of laws regulating the operation of mines and miners’ wages, and ore mining flourished. Following centuries of excavations, the mines were opened to the public in 1976 and, in 2017, they were classified as a UNESCO World Heritage Site. Miners battled the elements when extracting ore. Primitive excavation methods were dangerous. Among the hazards encountered by the miners were mine collapses, falling rock and the lack of oxygen. Working conditions were made more difficult due to inefficient lighting. Shafts and pits were regularly flooded. Despite these hazards, miners excavated 150 km of underground corridors.

Visitors are required to wear safety hats. They descend 40.5 metres below the surface. They explore mine faces, transport galleries, enormous chambers and low corridors - at the lowest point on the sightseeing route, the tunnel is a mere 140cm high. There are themed displays which are accompanied by sound effects, for example the sound of a collapsing mine, minecarts on the move or blasting.

The Black Trout Adit, also known as the Underground Venice, offers one of the most popular tourist attractions in the region – a boat trip along the old drainage gallery (270 metres).

There are also geological phenomena which are well worth a visit - a bell-shaped karst crater is one of them.

Because of the constant temperature of no more than 10°C and the high humidity, visitors are recommended to wear warm clothing and comfortable footwear.



Visitors explore mine faces, transport galleries, enormous chambers and low corridors.

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UNDERGROUND TREASURES: WIELICZKA SALT MINES

Under the city of Wieliczka, at a depth of 327 metres, lies a vast metropolis created by natural forces 15 million years ago, when southern Poland was an ocean. It offers breathtaking rooms, chapels and altars, countless sculptures, examples of bas-relief, green salt lakes and even a church. The nine levels and over 287 km via horizontal of this complex features 2,040 chambers (only 22 of the chambers can be explored, with the tour starting 64 metres underground).

Eight hundred steps lead us through the history of one of the world’s most ancient salt mines. Classified as a World Heritage Site by UNESCO since 1978, the Wieliczka salt mines welcome a million awestruck tourists each year, making this the most popular attraction in the Krakow metropolitan area.

There are distinct routes around the mines. The most popular one is dedicated to the miners, their traditions and rituals, allowing visitors to experience the routine of underground life, measuring the methane concentration, digging and carrying salt and exploring unknown caverns. The second tour takes a religious approach, culminating in a solemn mass. A visit to the Graduation Tower offers a pleasant form of inhalation therapy.

The highlight of this tour is the visit to St. Kinga’s Chapel, at a depth of 101 metres and believed to be the largest underground chapel in the world. Dating back to 1896, the religious figures and adornments have all been created from salt, melted down, purified and then solidified again to produce a glassy finish.

The excellent acoustic makes this a perfect venue for concerts and other cultural events and the chapel is also popular for weddings.



The Wieliczka salt mines were classified as a World Heritage Site by UNESCO in 1978.

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Saint Barbara is the patron saint of miners. View of the “Guido” inner chapel, in Zabrze.

HISTORIC COAL MINE “GUIDO” IN ZABRZE

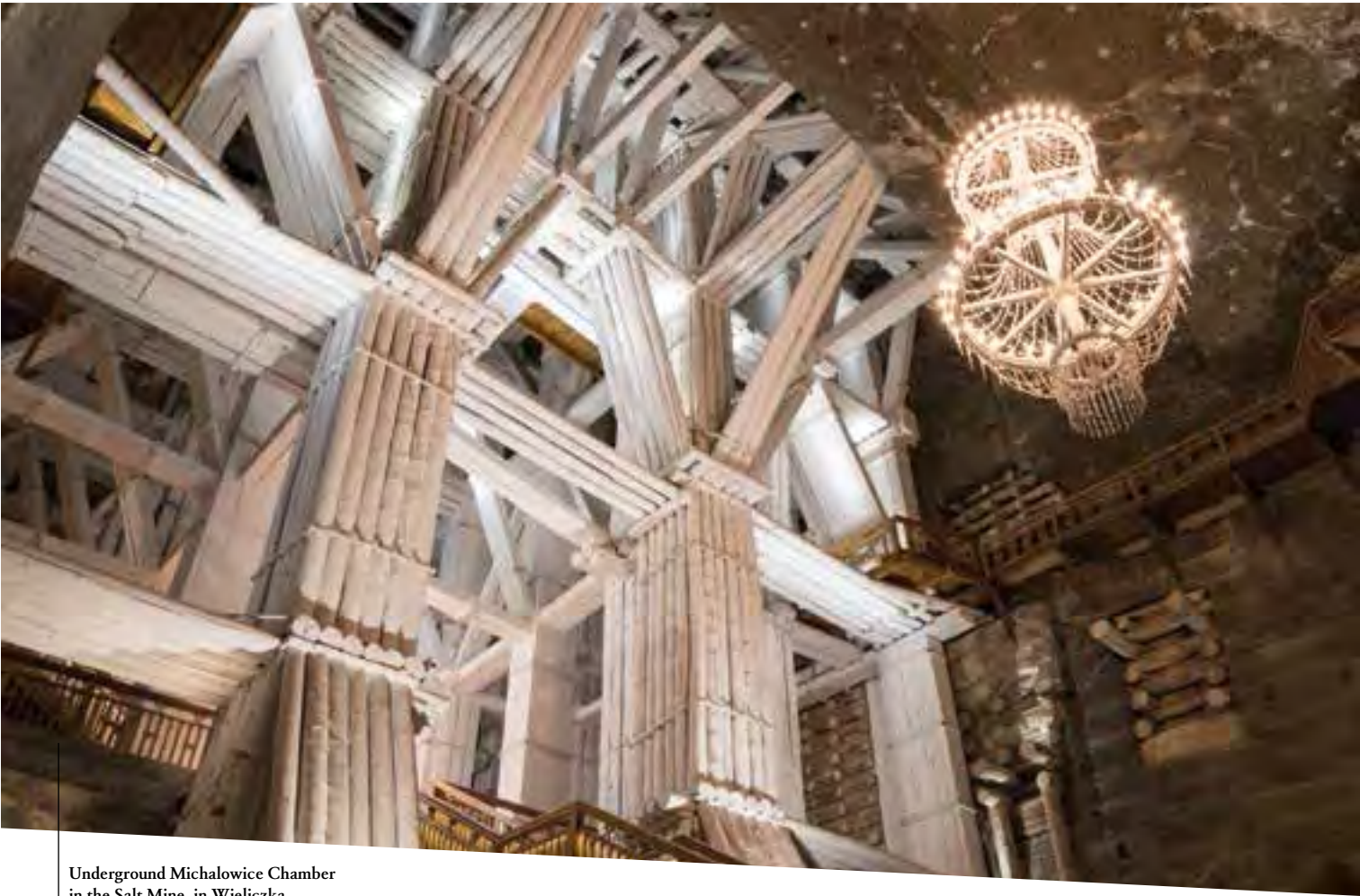
The Guido Coal Mine in Zabrze was founded in 1855 and named after its founder, Count Guido Henckel von Donnersmarck. For a few hours, visitors to Guido become miners. They are handed safety helmets, miner’s lamps and breathing apparatus... Each time, the underground tour begins by descending the “Kolejowy” shaft in an authentic mine shaft cage.

At “Level 170”, 170 metres below the ground, there is an exhibition dedicated to the history of the mine and mining in the Silesia region. Three original underground stables, where working horses used to be kept, are a unique feature.

The famous St. Barbara’s Chapel (the patron saint of miners) is imposing, set in an industrial environment and blending the monumentalism of Silesian neogothic churches.

“Level 320” (320 metres below ground) has a modern feel. Visitors have access to an authentic excavation wall, a modern longwall shearer and a powered roof support. This gigantic machinery, switched on by the tour guide, leaves a lasting impression on visiting tourists. Part of the route is covered by travelling in a suspended monorail system – the only system of this type in the world open to the public.

Visitors seeking adventures 355 metres below ground level are invited to participate in mining work. They might be asked to assemble a conveyor belt or to cut a wooden pit prop. And then visitors can finally put their feet up and enjoy a Guido draft beer at the “Pump Hall” - the most underground pub in Europe.



Underground Michalowice Chamber in the Salt Mine, in Wieliczka.

© Ewelina Soponicka / Getty Images

BOOKshelf

BOOKS FROM AROUND THE WORLD

The following list is comprised of books that relate to the various topics explored throughout this issue. It provides an entry point for readers that may want to further examine these themes through handpicked selections that promise to enrich worldviews.

1.

THE OCEAN PLASTIC BOOK

How Pippa Became the Queen of the Ocean

CREATED with an environmentally friendly raw material made from recycled ocean plastic, “The Ocean Plastic Book” tells the story of little Pippa, a brave girl who dreams of diving deep into the sea to meet ocean animals. However, once she gets there, Pippa finds out that they can’t swim and, that to enable them to do so, she has to get rid of plastic. What makes this kid’s book about marine litter special is mostly the fact that it was made of waste. Plastics from all over the world were collected by The Waste Free Oceans foundation to use for the paper and the cover.

To turn plastics into paper, this non-profit organisation committed to reducing marine litter worldwide developed an innovative process: turning recycled plastics into fibres that are aligned to tear - and water - resistant material. Just like real paper. The idea behind the story was to give useless plastic in the ocean a useful purpose: changing the readers’ behaviour towards plastic use to preserve the beauty of our oceans – for ages to come.



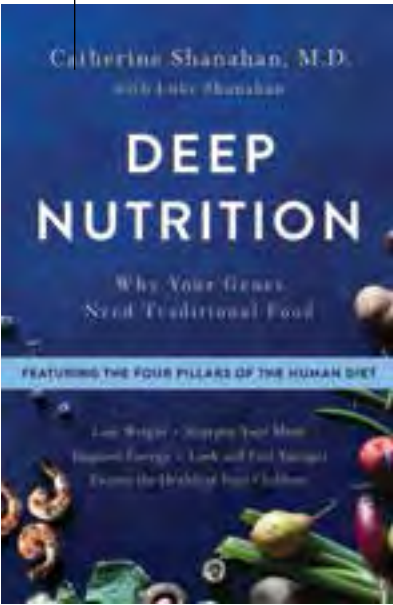
This is a book intended for children – adults are also welcome – made from trash, garbage collected in marine environments. That is, each of these books helps to clear the oceans and shows one good example of plastic recycling.

BOOKshelf

BOOKS FROM AROUND THE WORLD

3.

The book shows how the habits of our ancestors can help us lead longer, healthier, more vital lives.



THE DIGITAL MIND: How Science Is Redefining Humanity

What do computers, cells, and brains have in common? All three are information-processing devices. Computers are electronic machines created by humans; cells are biological entities designed by evolution; brains allow humans to process data in a way unequalled so far by any machine. This is the starting point of this book, in which Arlindo Oliveira, Professor at Instituto Superior Técnico, in Lisboa, and a specialist in Computer Science, discusses the emergence of digital minds. But now we know that artificial intelligence will one day make it possible to model, simulate and understand biological systems and even complete brains with unmatched levels of detail. These digital minds will replace humans in many tasks, which leads the author to other unavoidable questions: will they become our partners or our rivals? Or both? And what are the social, legal, and ethical implications of their existence?

2.

THE DIGITAL MIND

HOW SCIENCE IS REDEFINING HUMANITY

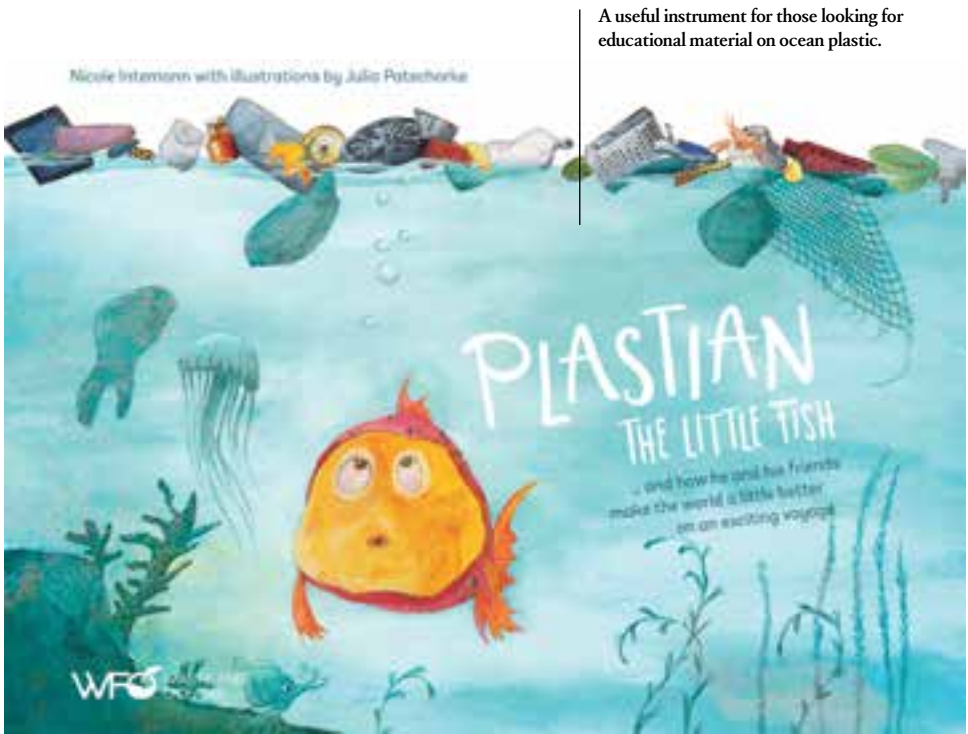
ARLINDO OLIVEIRA



DEEP NUTRITION: Why Your Genes Need Traditional Food

A self-published phenomenon that goes deeper on the impact of diet choices. “Deep Nutrition” examines the nourishment habits that enabled our ancestors to sculpt their anatomy, engineering bodies of extraordinary health and beauty. Examining diets around the world - diets like the Mediterranean, Okinawa (in Japan), and “Blue Zone” (places where people live longer) -, Physician and biochemist Catherine Shanahan identifies the four common nutritional habits that produce strong, healthy and intelligent children, as well as active, vital elders, generation after generation. They rely on fresh food, fermented and sprouted foods, meat cooked on the bone, and animal internal organs. Combining her research with the latest discoveries in the field of epigenetics and her experience as an elite athlete who used traditional diets to treat her own injuries, the author shows how food directs people’s cellular growth and how the way we all eat and live can alter our DNA to the point of affecting the health of our future children.

PLASTIAN THE LITTLE FISH



A useful instrument for those looking for educational material on ocean plastic.

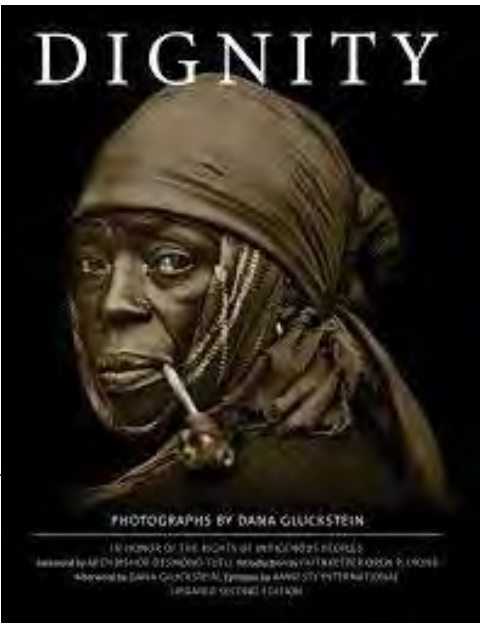
A brother and sister embark on a sea adventure and become concerned by the amount of marine litter in the water. This is the story of “Plastian the Little Fish”, an illustrated children’s book about the impact of waste in our oceans. In this exciting journey, Lily and Mo discover a mysterious place that their Great-Grandma had told them about. They build themselves a boat and set out across the sea, but the boat spits out hundreds of plastic pieces. Plastian, the little fish, spies the brightly coloured plastic trail and swallows masses of the tiny bits, causing him to have a terrible tummy ache. Then, the siblings have a brilliant idea... The Waste Free Oceans foundation, which removes and transforms marine litter by mobilising fisheries, recyclers and brand owners, partnered with the author of the book, Nicole Intemann, in order to raise awareness on the issue and to educate children aged five to ten on the problem and its solutions.

4.

5.

DIGNITY: In Honor of the Rights of Indigenous Peoples

A collection of more than 100 black-and white duotone portraits made over three decades by Dana Gluckstein, the book expresses the theme of tribes in transition by capturing a brief period of History where traditional and contemporary cultures collide. Its first edition celebrated the 50th Anniversary of Amnesty International, the Nobel Peace Prize-winning human rights organization. Beginning with a moving foreword by Nobel Laureate, Archbishop Desmond Tutu, “Dignity” makes a powerful and impassioned call to action in support of Indigenous Peoples who are among the world’s most impoverished and oppressed inhabitants. It includes the full text of the United Nations Declaration on the Rights of Indigenous Peoples adopted in 2007 by 144 countries. The Declaration is the most comprehensive global statement of the measures every government needs to adopt to ensure the survival, well-being and dignity of these people.



“Dignity” is a three-time winner of the International Photography Awards

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