ROYAL BELGIAN INSTITUTE OF NATURAL SCIENCES

ANNUAL REPORT 2015

THE RBINS IN BRIEF

Missions

RBINS has been entrusted with four major missions:

- Scientific research into natural sciences;
- Scientific expertise at the service of the public authorities;
- Conservation and management of scientific and heritage collections;
- Dissemination of scientific knowledge in society.

Research & expertise

One out of every three people at the RBINS is a scientist. The scientific personnel includes mainly biologists, palaeontologists and geologists, but also oceanographers, anthropologists, prehistorians and archaeologists, as well as geographers, physicists, bio-engineers and mathematicians, which enables it to conduct multidisciplinary research.

Lines of Research

- Biodiversity and mechanisms involved in the evolution of life;
- Land, freshwater and marine ecosystems;
- History of life, the climate and human installations;
- Geology of Belgium and modelling the North Sea.

Service Provision

- The RBINS provides scientific expertise under Belgium's international commitments in relation to environmental protection.
- It develops tools and methods for monitoring natural land or marine environments.
- It also offers useful advice for the development of national and European policies for the protection and conservation of biotopes and biodiversity and the use of natural resources.

Collections

With their 37 million specimens conserved as Belgian heritage of universal significance, the RBINS's collections come just after London and Paris in the European classification, and belong to the top 10 largest collection in the world. They serve above all as reference and research tools and as such belong to the European 'major research infrastructure'. In this respect they are constantly being visited and studied by researchers from around the world. For several years now, the RBINS has been committed to an ambitious programme to digitize its collections and to do so has developed an open-source software, DaRWIN, which has made it possible to encode all the data on any collection of specimens, whatever their taxonomic group.

Museum

For the general public, the Natural Science Museum is the visible part of the RBINS. It has 16,000 m² of permanent galleries, temporary exhibition rooms and educational workshops, public spaces of all kind, enabling it to welcome more or less 300,000 visitors each year, approximately 30% of whom are school groups. Its Dinosaur Gallery is world famous and the largest in Europe.

It plays a leading role in the promotion and dissemination of scientific culture, both within and beyond its walls, notably through travelling exhibitions and events. We are pursuing iambitious efforts to gradually renovate the premises, to make the Museum more convivial and better adapted to people's expectations. Our Museum also takes a resolute position promoting a more respectful approach to nature.

FOREWORD

A strange year, 2015. From the budgetary and institutional reforms in the beginning to the terrorist threat at the end, it was also a chance to reflect on fundamental questions about our role and how we function.

A living collection is a collection that is studied and used, which answers research questions and keeps up with developments in the field. How can we ensure ours best meets these needs? This question was raised again when the Nagoya protocol entered into force. It aims to share the benefits of using genetic resources in a fair and equitable way, no matter where in the world these benefits are found.

So if a Swiss team takes out a patent after researching specimens conserved in Australia that originated in Madagascar, Madagascar must receive its proper due. Our Institute, which maintains specimens for fundamental research, rigorously documents every step of the process: collection in the field, entry into the collection, studies, loans, and so on. This can help the specimens' countries of origin to assert their rights.

This is what pushed us to clarify and harmonize the management of our immense collections. Since December 2015, our Institute is one of the first natural history museums - perhaps the only one - whose collection management is recognized by international ISO 9001 certification. This is greatly satisfying, and also constantly demanding. But these are healthy demands which ensure the collection can remain open long-term with high quality management.

A living museum is a museum open to all, as broadly as possible: to the greatest diversity of visitors, to the newest ideas, to evolutions. Our institution rose to this challenge beautifully with the opening of the new permanent gallery on human evolution and the human body. The space charts the latest discoveries on the history of human lineage. It is very educational, and very popular. But the human body is no ordinary scientific topic. Everyone can relate to it concretely and intimately. Talking about our bodies is talking about ourselves: a sensitive subject, as we saw with the controversy over the poster at the opening. With this exhibition, we aim not only to transmit scientific knowledge, but also to push forward ideas and practices, particularly with teenagers who sometimes struggle at this critical age.

We did have to close the museum - the maximum alert level and lockdown made these measures necessary. Extreme measures, since a closed museum is not a museum at all. **Without visitors, without research, the museum dies. And we want to live, openly, actively, curiously, inventively… in other words, scientifically.**

Camille Pisani,
General Director

Putting our Institute on the map
From Bernissart to Benin

Science is a global affair. As such, it is no coincidence that this 2015 Annual Report takes us on an exploration from the Gobi Desert in Mongolia (page 12), to the peaks of the tabletop mountains in Guyana (page 13). With our collection of species among the world's top ten largest, and with our international reputation for scientific excellence, the Institute has to be a global player. Every part of our work has an international outlook, from research projects, to networks and partnerships, to collections, exhibitions and publications.

Treaties and conventions form the basis of a lot of our international work – a good example is explained in our article on the Nagoya Protocol (page 19). The Institute has been the Belgian National Focus Point to the Convention on Biological Diversity for over 20 years now. Part of this role is to train early career scientists from across developing countries in Asia and Africa as part of the Global Taxonomy Initiative, financed by the Directorate-General for Development Cooperation of Belgium.

Working internationally is all about being connected, and the Institute's role in international networks allows regular cooperation. We host the Consortium of European Taxonomic Facilities (CETAF), for instance, representing 56 scientific institutions across 19 countries. Our work on this crucial topic of taxonomy is detailed in articles on pages 8 to 9, from the depths of caves in Benin to forests of Vietnam.

Our collection is a source of worldwide interest for researchers. Various international connections help to continue its enrichment, including work to bring specimens in from abroad, such as the Transylvanian red-toothed rodents we discover on page 15. Our research work very often involves international partners as a result, and the publications we produce reach a global audience.

Projects financed by the European Commission allow the Institute to work closely with international partners, and in 2015 the Institute was involved in 26 projects funded by the European Union, such as the SYNTHESYS 3 project which supported the innovation in digitalization explained on page 20.

Lastly, exhibitions are a great opportunity to work with partners across the world. Co-productions like *WOW-Wonders of Wildlife* (with Granada, Spain, page 23) are often successful since the costs and risk associated with developing the exhibition are shared among the partners, and each benefits from the others' expertise and resources.

Seen from the rest of the world, the Institute stands out thanks to our uniqueness – the richness and complexity of our work, and the variety of disciplines we represent. The Institute is still working on a full strategy to maintain our profile internationally. The better we secure our place on the global scale, the more we develop partnerships and activities to improve our research and collections further still.

Full, integrated certification achieved in 2015

The Institute is a complex organization. Efficiency is crucial to ensure quality in management, health and safety in the workplace, and minimal environmental impact. In December 2015 our team's efforts were recognized as the Institute was fully, formally certified in each of these three areas: ISO 9001 for quality and efficiency of management process; EMAS for our environmental management system and OHSAS for occupational health, safety and wellbeing. The task of obtaining these three sets of certification shared three common goals.

One key challenge for the Institute is to support fair access to biological resources, ensuring the benefits they provide are shared as much as possible. In this regard, the Institute was already working to adhere to the international Nagoya protocol, described on page 19. The logical next step was to ensure that the support services were meeting the same expectations of quality management. Processes needed to be documented, optimized, implemented and audited, with the auditors' recommendations taken into account before moving to the certification phase. The Institute now works to maintain this lean management on a three-year cycle.

As an institute for natural sciences, we must practise what we preach. This poses **a second crucial challenge: monitoring our activities and reducing their environmental impact**. Having already received a 2* label from our governing regional administration, we were keen to obtain EMAS certification. Key targets were put in place for a range of aspects: more ecological means of transport, energy and water consumption, waste and raising awareness of sustainable development, for example. Having achieved certification, procedures are now in place to continue this attention to reducing our environmental impact.

One final set of challenges is to keep all our staff, from our lawyers to our electricians, aware of our responsibility to our environment, and to keep risks under control. All three sets of certification were crucial in reaching these goals. Occupational health, safety and wellbeing is important in any workplace, but in museums where technical equipment and materials such as alcohol to preserve specimens are used regularly, it is really important that procedures are followed carefully. Achieving OHSAS certification meant making sure tasks are clear, personnel is trained, and instructions, forms and procedures are in place to make sure things are done right. Built into the system is an adaptation process to ensure continued improvement.

For our staff, getting certified was a mammoth task, but we were convinced of the need for change, and certification had the additional advantage of helping us share best practices throughout the Institute. The real pay-off became clear when we realized the time we save, or when a new colleague is recruited, how much easier it is to explain their role to them. **Achieving certification highlighted one of our main strengths: how closely we pull together as a team**.

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1 RESEARCH

Revealing the **biodiversity of Brussels' hidden gem**

Anyone visiting the Jardin Massart in Auderghem would know it as a peaceful, leafy spot buzzing with wildlife, a secret garden of rare species both exotic and local, hidden in plain view on the edge of the Forêt de Soignes. **Only now have researchers been able to uncover just how diverse the botanical garden's insect life really is, through a project called Objective 1000, named after the number of species it recorded.**

The survey was carried out by entomologists from the Institute and over 30 dedicated volunteers, and financed by Brussels Environment (IBGE). Fifteen types of trap were set up across the garden and for a year, the team recorded the species of insect they found. After carrying out inventories of insects as far afield as the mangroves of Singapore, it was quite a novelty to be working somewhat closer to home.

Among the most eye-opening results of the inventory was that the garden contains a fifth of the total number of all species of weevil and longhorn beetle known in Belgium. As for hoverflies, more than a quarter of Belgium's species can be found in Jardin Massart, and a third of the country's types of ladybird. Experts also recorded the presence of very rare species, including 25 species of fungus gnat which have never before been recorded in Belgium.

The entomologists are not stopping there – by 2017, they would like to set themselves a target of recording 2017 insect species, and from there, publish a monograph about the rich insect biodiversity at Jardin Massart.

A hotspot for biodiversity beneath the waves

The floor of the North Sea is not exactly known for its biodiversity. Years of fishing have put a lot of pressure on the animal and plant species living off our coastline. But **in 2015, researchers from the Institute rediscovered an underwater area which reveals the huge diversity that once thrived there – and could return.**

These gravel beds on the sea floor are found around the Hinderbanken, sandbanks 30km from the coastline. They were breeding grounds for fish back when herring and oysters still prospered there. The zone was first identified as a hotspot for animal species over a hundred years ago by Professor Gustave Gilson, a Belgian pioneer in biological marine research and director of our Institute at the time. Relics of this animal life were uncovered with a first inventory, started ten years ago by the Institute's research teams.

Last year the Flemish research ship Simon Stevin set sail once again to investigate the biology of the gravel beds. Researchers from the Institute saw all the signs of the drop in biodiversity caused by fishing over the years. In certain areas however, fishing gear is not able to touch the sea floor, and biologists found signs of typical species including whelks and spider crabs. These species are not currently found in great numbers, but they do give an idea of the area's potential for rich aquatic life.

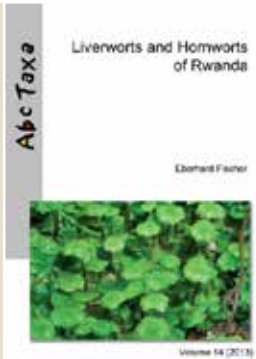
Thanks in part to this research, the zone will now be protected. The question now is whether the sea floor can be sustainably managed well enough on the long term to allow this biodiversity hotspot to make its comeback.

07.02

For the third year running, In Vivo photo workshops give visitors another chance to participate, taking a fresh look at nature and at the museum.

10.02

Volume 14 of the journal *ABC Taxa*, produced by the National Focal Point to the Global Taxonomy Initiative, with the support of the Development Cooperation, is named best bryological publication of 2013-2014.



Why taxonomy?
Poachers, Darwin and chocolate pralines

We are all taxonomists. Ever hold something up on your fork in a restaurant, to work out what you were eating? Identifying and classifying living things is what taxonomy is all about. It is a fundamental science, but its applications are all around us, and this is reflected in the wide and varied tasks of the team of the taxonomists at the Institute.

Taxonomy in its most basic form is a survival technique, and it is not limited to humans. To survive as a species, we need to be able to recognise which animals and plants are dangerous, and which we can eat. Even apes and chimps have been shown to be able to identify plants. We cannot always capture and identify every animal we come across, which is why it is helpful to classify animals into families.

Conservation of the natural world depends on taxonomy. To protect biodiversity, we need to identify species to know which are rare or threatened. Poachers can be tracked down and arrested if what they are transporting turns out to be a protected species. In seas and rivers, the presence of certain species is regularly used by marine biologists as an indicator for certain types of water pollution.

We also rely on taxonomy for our understanding of evolution: Darwin himself was a taxonomist, after all. His discoveries on the Galapagos Islands did not lead him directly to his conclusions – it was only after months of, amongst others, taxonomical work that he was able to put his theory together.

Creationists have argued that spiders fossilized in amber and modern-day specimens are very similar, if not identical, so that they seemingly did not change over time. This fuels the creationist claim that evolution is a myth. Thanks to taxonomy, we can show that in fact the two spiders are very different, despite appearances.

The economic stakes may not be apparent at first, but when it comes to identifying species, they are very significant. A company importing grains found dried remnants of a gecko in the grain, and worked with the Institute to have it identified, to be able to prevent future contamination by this particular species. The Institute was even approached by a chocolate company to identify whether the animal shapes of its pralines were a real species or not, since intellectual property rights only apply to fictitious objects. Safety can also be a concern: when the Belgian Air Force has difficulties with birds flying into propellers, they approach researchers to identify which species of birds were involved in the collisions, to understand their anatomy and behaviour in order to prevent these collisions in the future.

The Institute has a significant global voice on the topic, heading the editorial team of the *European Journal of Taxonomy*. In the following articles, we look deeper into some of the Institute's achievements, thanks to our team's taxonomical expertise and tools. From protecting against disease, to improving water quality, to getting schoolchildren involved in describing new species, they show the extent to which taxonomy is crucial to our work.

07.03

Comedy, theatre, role-play activities, jazz and avant-garde photography take over the Museum: a real treat for the 2,443 visitors at Museum Night Fever.

18.03

Alain Drumont and Antonio Verdugo win the Passet Prize, one of the French Entomological Society's nine prizes, which recognizes work making the greatest contribution to general entomology.

Belgium's youngest taxonomists help describe a new species

Students at three Belgian primary schools had a taste of life as a taxonomist, thanks to the work of a team of researchers from the Institute. For two months, 60 children observed and described the activities of a new species of stick insect from Cambodia. This species was not yet named, and that task was left to the students as well.

The idea behind the project was to include children aged 8-11 in **a participatory citizen science project** that would allow them to discover and experience first-hand the work of describing a species. Taxonomy is not an easy concept to communicate, but the Institute's team took a simple approach. Why do we have names for the types of animal around us? How do we tell the difference between one species and another? After an initiation into the topic, the team set up terrariums in each classroom containing the newly-discovered stick insect, encouraging the children to make observations, just as those same researchers did the previous year when they described the second largest living insect on the planet.

It turns out that having a terrarium to stare into during lessons can be extremely productive for taxonomical research. Not only were the children extremely attentive, they also made observations which impressed the researchers, including noting that larvae tended to gather at different heights to adults in the tank. Their work will be included in a scientific article put together by the Institute, describing several species from Cambodia and Vietnam. In April 2015, the students came together to present the outcomes at a special event in the Museum, where they had a behind-the-scenes tour, visiting the vivarium, collections and laboratories.

The response from the students was phenomenal. The project also sparked their interest in the importance of biodiversity and the need to protect delicate ecosystems. They were struck by the enormity of the number of insect species that still remain unknown, estimated at almost 80%.

And the name the students chose? *Lophaphus apsara*, named after the dancers gracing the walls of the temples in Angkor, back in the insects' native Cambodia.

Taxonomy for public health: barcoding Belgian mosquitoes

One of the biggest stories to hit the headlines in 2015 was the outbreak of Zika virus in Brazil – a serious disease transmitted from person to person via mosquitoes. The speed and extent of the outbreak was extremely challenging for public health authorities. Although the species that carries Zika virus has not reached our shores, disease carried by mosquitoes could pose a threat in Europe in the future. **To help provide an early warning of any alien species becoming established, the Institute has been working on a DNA barcode database of the 23 mosquito species known in Belgium.**

Aedes japonicus is an invasive species of mosquito sometimes found in Europe. It most often comes across from Korea and Japan when we import tyres, hatching its larvae in damp cracks in the rubber. It is not currently a vector for disease, and has not established itself well in Europe, although it is important to monitor the species in case the situation alters, which can happen due to climate change.

19.03

Our Belgian Marine Data Centre is one of just two centres to be accredited by UNESCO's Intergovernmental Oceanographic Commission.

20.03

The Museum celebrates World Water Day, including guided visits and 'Eau- JA!', a recycled river art installation in Leopold Park.

Looking at mosquitoes, it is not always easy to tell the difference between each species. **DNA barcoding is the quickest way to identify a mosquito.** Although it requires specialist tools, it has the advantage that no expertise in insect morphology is necessary, and it is significantly faster than examining the specimen. **The Institute has its own DNA sequencing facility**, and together with a team of researchers from the Royal Museum of Central Africa, University of Antwerp, Catholic University of Leuven and the Institute of Tropical Medicine Antwerp, with financing from the Belgian Science Policy Office (Belspo), they were able to put together a comprehensive, open-access database for Belgium's 23 species of mosquito.

An international DNA database for mosquitos also exists, but a national version is essential to take account of the genetic variation that we see in each mosquito species from country to country. The database records not only sequences for each species, but also for each individual specimen, making it as comprehensive as possible.

Thanks to the database, and the Institute's continued work on DNA barcoding, if disease-carrying mosquitoes like the tiger mosquito *Aedes albopictus* do manage to settle in Belgium, we will be the first to know.

Taxonomy and development: water quality in Benin

What can taxonomy tell us about water quality? Researchers from the Institute teamed up with the Université d'Abomey-Calavi in Benin to carry out research on 43 water wells which are traditionally dug by hand, across the south of the country.

Not much can survive in water underground. Without light, plant life is impossible, and without plants there is little for animal life to feed on. Some animals have adapted to survive in these harsh conditions, and they are known as stygobionts. Sometimes other creatures are found underground, that we would normally expect to see above ground – sludge worms, for example. Sludge worms in water underground are a sign that the underground water has been contaminated – they will not survive for long, and are probably feeding on some kind of organic pollution which has washed down there from the surface.

This means that **the species of animal found in the water can act as an indicator for water pollution**. If we sample the water and find a range of stygobionts, it can tell us that the water has not been contaminated, whereas if we find many creatures like sludge worms, it hints that there is an issue with the water quality.

The Institute had previously worked on this issue in Morocco, where it was found that latrines dug nearby could easily cause issues with the water quality which were reflected in the animal life sampled in wells. **In May 2015 the project was launched in Benin, and was an absolute first** – no research whatsoever had been done on biodiversity in underground water in the country. Researchers from the Institute trained students locally in taxonomy, so they could recognize their own biodiversity and analyze water samples themselves. 73 samples were taken from wells across the region using specialized equipment. Our partners from Benin also travelled to Brussels to be trained on taxonomy and DNA sequencing techniques.

This project means that Benin can monitor and map its underground biodiversity, and draw significant conclusions about its water quality. Since each underground basin has its own specific set of animal life, by sampling the water from wells we can also tell which basin it has come from, helping us map underground waterways. The project could eventually be expanded to the rest of the country, providing a complete reference for the whole of Benin.

26.03

The research vessels RV Simon Stevin and RV Belgica provide valuable information by emitting and receiving sound waves and produce crucial knowledge for building projects at sea and estimating marine sand reserves. A unique and complex experiment in the Belgian part of the North Sea.

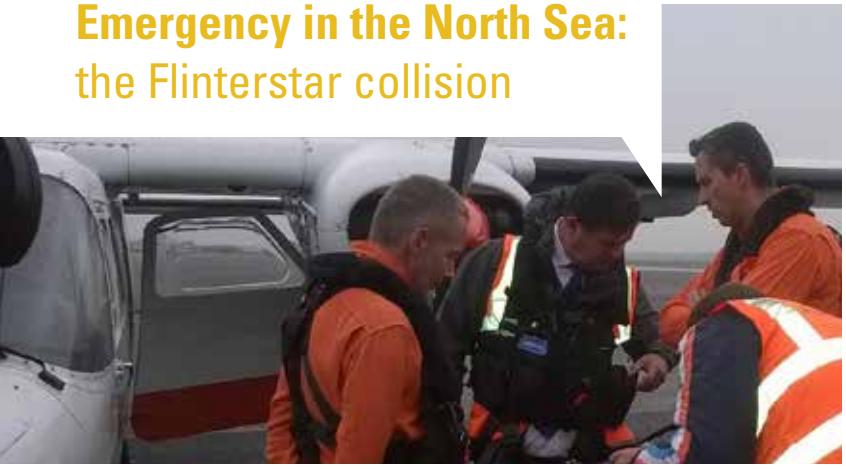
New North Sea model is good for the sole

Sole is a firm favourite on restaurant menus in Brussels. It is also an important source of income for the North Sea fishing industry. To make sure we fish it sustainably, it is crucial to have information about the fish populations so we can estimate the impact we are having. **Researchers at the Institute have come up with a prizewinning model which makes it much easier to make predictions about this tasty fish in particular.**

It is not easy to predict how an individual fish will move. But groups are surprisingly predictable. Sole are known to spawn in spring in the North Sea, before their eggs and larvae are transported by the currents towards coastal areas where the young fish can grow. In the past, numbers of adult fish were used to define fishing policy, but this was not an effective way to measure populations, precisely because of this movement of larvae. Modern models therefore use information about the currents and the fish biology to model how this transport takes place. What is particular about the Institute's new model is that it is especially sensitive, taking into account a wide range of factors including the behaviour of the larvae, and integrating uncertainties in a new way.

In February 2015, a presentation of the model won an award at the ASLO 2015 Aquatic Sciences Meeting in Granada, Spain. As this model is validated, calibrated and further improved, it can be used as a tool to manage sole populations in the North Sea, helping to define fishing policy and quotas.

Emergency in the North Sea: the Flinterstar collision



It was almost a head-on collision between the Dutch freighter Flinterstar and the Al-Oraiq tanker, early morning on the 6th October 2015. The Flinterstar was leaving the Port of Antwerp when the crash occurred with the 120,000 ton tanker that was heading for Zeebrugge, just eight kilometres from the coastal town. All 12 crew members were rescued from the icy waters, but the ship began to sink, and large, glossy oil soon surfaced.

The Institute's surveillance aircraft was instantly called into action. **Our scientists played a crucial role in evaluating the environmental impact of the situation.** In the days following the accident, our aircraft flew over several times a day, recording data about the oil spilled from the wreck. Other teams from the Institute made simulations of the wind, the waves, and the oil drift to predict the danger of the oil reaching the coast. If there had been any risk to Belgian beaches, the coastal communities could have been alerted immediately. On Friday 9th October, Secretary of State for the North Sea Bart Tommelein boarded the surveillance aircraft to see the situation for himself, declaring the situation "serious but not dramatic."

The total oil spilled from the Flinterstar was 100-300 cubic metres, stretching across 20-30 kilometres. It looked bad, but in fact was kept well under control, and did not reach the beaches in any great volume. Samples showed that no oil was found on the sea floor – it was most likely dispersed by the currents.

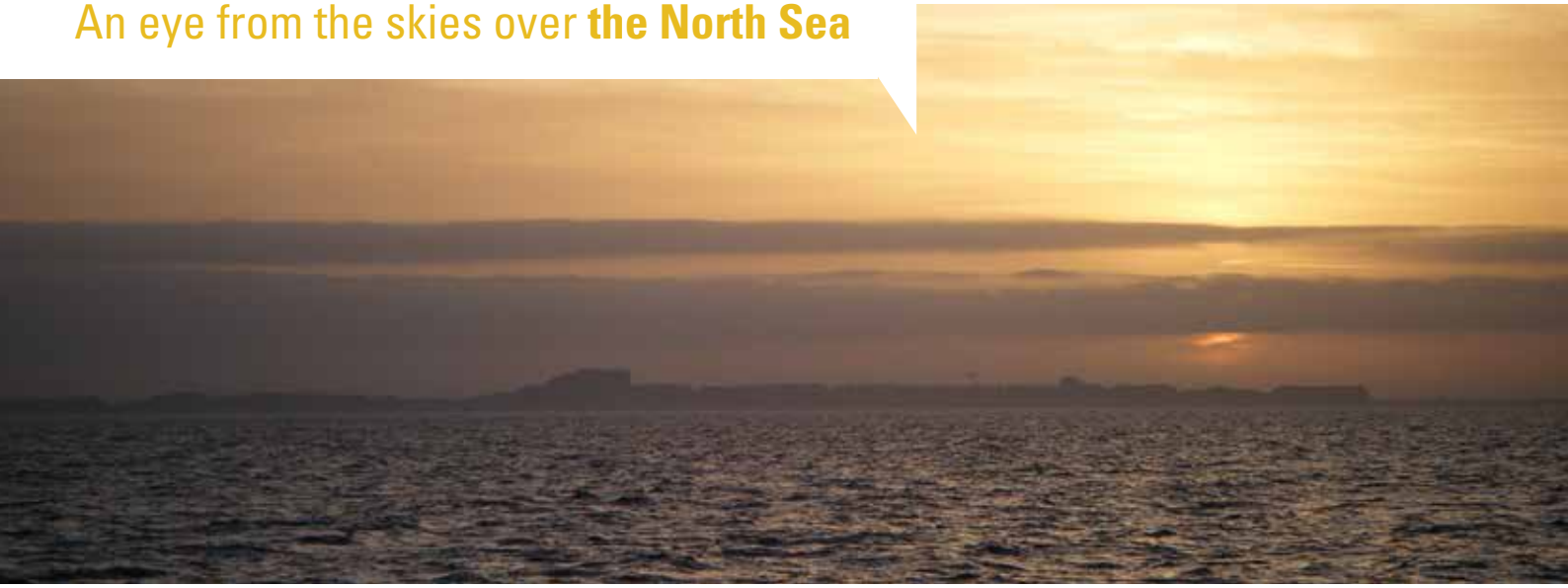
23.05

A giant Vietnamese stick insect described in 2014 makes the International Institute for Species Exploration's top 10 new species of 2015.

24.05

falconsforeveyone.be is an international success story: 2,900,000 clicks on the website from 157 countries and 20,000 people visiting the observation point in two months.

An eye from the skies over **the North Sea**



In 1991, illegal oil pollution in the North Sea had been a major concern for some time. Ships were deliberately dumping oily waste into the sea, with serious consequences to the vulnerable species and habitats. **To combat this pollution, a military aircraft was equipped with sensors and converted into a surveillance aircraft, managed by the Institute as part of its work on North Sea surveillance**, and later handed over from the military to the Institute. 25 years later, the same plane is still helping to protect the North Sea, bringing the numbers of detected illegal oil spills from 50-60 per year in the 1990s down to zero recorded incidents in 2015.

Nowadays the plane is a familiar sight over the coastline, and this familiarity is very helpful in preventing pollution – if the perpetrators see the plane flying overhead, they are much less likely to dump oil. Any polluter found guilty thanks to the Institute's surveillance work can expect a hefty fine in court. Even if oil dumping has been greatly reduced, chemical dumping is still an issue, and it is harder to spot from the skies.

In 2015, new legal guidelines were introduced, that had been drawn up by the International Maritime Organisation, to limit the amount of sulphur that can be emitted into the atmosphere. To help enforce these guidelines, the Institute tested a new sensor on board of the aircraft called a "sniffer". The plane flies low over ships and the sensor detects excessive sulphur in the fumes. The test phase was a success and a sniffer will be installed in 2016. The aircraft still monitors other activities – are ships in the right lane, and are fishing boats in the right zone? Environmental permits are required for wind farms and zones of marine aquaculture, and the surveillance aircraft also monitors the conditions associated with those permits to ensure everything is in order.

Accidents do happen, and if oil is spilled when two ships collide, the aircraft is always on the scene as part of the Coast Guard to help resolve the situation from an environmental perspective. In the 2015 oil spill from the Flinterstar which collided with a tanker, the aircraft's intervention was an essential part of the follow-up operation. From the aircraft it is much easier to see the exact extent and drift of the oil spill, and guide vessels whose role is to combat the spill.

From the sky, a lot can be seen of life beneath the water too. The plane checks biological events like the algal bloom every spring and autumn, letting scientists know when they can go take samples. When visibility is good, marine mammals can also be monitored. Researchers on board count porpoises and seals. If larger whales are sighted, the aircraft can check to ensure they do not become stranded.

A surveillance aircraft is a unique attribute for a research institute, and its role is still developing, thanks to the hard work of the team at the Management Unit of the North Sea Mathematical Models, which controls its activity.

30.05

Visitors have a chance to taste insects, take part in various activities and conferences and discover the Museum's new bee colony at the launch of insect week.

04.06

Elke Sleurs, Secretary of State for the Belgian Science Policy Office, and Marie-Christine Marghem, federal Minister for Environment, open our BZZZZZ trail showing their commitment to the bees cause.

Why underdogs don't always lose out

Imagine a species of spider where the males have a particular hump on their backs, which secretes a substance that the females find irresistible. Now imagine a new variation of that spider evolved within the same ecosystem, but where the males have no hump, and no seductive secretions. You'd imagine the new variation would soon die out – surely with no "love potion", these new spiders would be at a huge competitive disadvantage compared to the humped Casanovas. And yet in the species of dwarf spider *Oedothorax gibbosus*, a relatively rare species found in wet areas of Belgium, this new, hump-free variation survives comfortably alongside its counterparts. How is this possible?

Evolutionary biologists at the Institute made computer simulations to model how the populations of the two variations of spider change over time, and published results in the journal Evolution. It turns out that the spiders without the humps actually mature a lot more quickly than their rivals. When mating season begins, the humped spiders are still struggling with adolescence, and so there is no competition for the hump-free variety. Then later in the season, once the humped spiders mature, they easily copulate with more females.

Modelling these population changes, it became very clear that the species benefits from having a balance of mainstream Casanovas and underdogs which fill the resulting niche. Too many of one creates an opening for the other to take advantage. In evolution, just as in many parts of life, being a "loser" can sometimes be rewarded.

Baby dinosaurs from Mongolia

The Dragon's Tomb is an area of the northwestern Gobi Desert in Mongolia, and its name is no coincidence. It is well known as a site for Late Cretaceous dinosaur fossils.

It was here that in 2015, palaeontologists from the Institute made the headlines for an exceptional discovery – baby duck-billed dinosaurs. The team worked together with the Universities of Ghent and Brussels to describe a group of *Saurolophus angustirostris*, a giant hadrosaur with a duck-like bill that lived 68 to 70 million years ago. The palaeontologists described three or four newborn specimens and two associated eggshell fragments. This hadrosaur has been found many times in the area, but never newborns.

The baby specimens have skulls just 5% the length of the largest known skull specimens from adults of the same species. Some familiar characteristics were already apparent, such as their upturned snouts, although not yet their distinctive crests. It is not clear whether the dinosaurs were still in their eggs or had just hatched when they died. **Scientists suggest these specimens may bridge a gap in our knowledge of the development of *Saurolophus angustirostris*.**

These particular specimens were dug up illegally by thieves to be sold on to private collectors and therefore had to be returned to Mongolia – but not before the Mongolian Ministry of Culture gave its special permission for the Institute to carry out its groundbreaking research.

07.06

Families celebrate World Ocean Day at the Museum including a Skype chat with the team on the RV Belgica live from the Atlantic and various activities.

10.06

The film How Big is Belgica, made by our team to mark 20 years of our research vessel, wins silver at the Deauville Film Festival Green Awards.

A last supper sheds light on the **evolution of beaked whales**

What did you last have to eat? For a beaked whale, the answer has been discovered 9 million years after its last meal, thanks to the rare discovery in Peru of a fossil skeleton with its stomach contents. As a result, the team which made the find were able to draw some interesting conclusions about how the family evolved.

It turns out that sardines were on the menu for this particular marine mammal. This tells us that the beaked whale in question fed close to the surface. Modern beaked whales, however, can dive thousands of metres to hunt for squid and fish, sucking the prey into their mouths. Palaeontologists had seen clues that the beaked whale's ancestors may not have been suction feeders, as they had more teeth, but this fossil was the first direct evidence of their diet and habitat.

The extinction of these shallow-dwelling beaked whales may be related to the diversification of true dolphins. As dolphins competed for prey less deep in the water, it might be that other beaked whales had to move deeper to forage for food. The study is published in the journal *Proceedings of the Royal Society B*. Researchers from Belgium, Peru, Italy, France and the Netherlands had been working together on the desert area of Peru where the fossil was discovered since 2006. The next step is a project about the specific environmental conditions explaining the marine diversity on sites like this, working with sedimentologists and volcanologists.

Stumbling across **one of the world's rarest mammals**

Every night at the camp, scratching noises were keeping a researcher from our Institute awake. The team was 2,216 metres up in the Guiana Highlands, atop one of the famous "tepui" tabletop mountains in the north of South America, one of the most remarkable landscapes on Earth, on an expedition looking for frogs and lizards. It was not until our researcher managed to catch the culprit and discuss it with Brazilian colleagues back at the lab that the team realised what was stopping them sleeping was **one of the rarest mammals alive – the Roraima mouse.**

The tiny, long-clawed mouse is also one of the most restricted mammals in terms of geographical distribution: it was previously known from only six animals collected in 1927 and 1989, all from the summit of another tepui, Mount Roraima, on the border of Guyana, Venezuela and Brazil. When our researcher took a photo, **it was the first photo ever taken of the species alive.**

In terms of its evolutionary origins, scientists did not know its place in the tree of life. Our researcher worked with a Brazilian zoologist to investigate further. Through a DNA sample, they discovered its closest relatives are found several thousand kilometres from Mount Roraima, on the distant Brazilian Plateau. This suggests that two and a half million years ago, the two areas could have been connected. They may have been separated by some geological or climatological event. Further investigation will tell us more.

16.06

The Museum is named one of the ten best dinosaur museums in the world by the CNN website.

23.06

For the first time, seven natural history museums (Berlin, Brussels, Copenhagen, Frankfurt, Leiden, London and Paris) meet as a select group with representatives of The European Commission's DG Research in Brussels, to develop a common research agenda.

The origin of… colour

What colour were dinosaurs? This question is one of the mysteries surrounding prehistory. Experts can make educated guesses about colour based on the dinosaur's environment. However, when it comes to feathered dinosaurs, researchers at the Institute have come across a tiny clue which holds the key.

The team of palaeontologists at the Institute have particular expertise in feathered dinosaurs – in 2014 their work on *Kulindadromeus* was named one of the top scientific achievements of the year by the journal *Science*. In 2015 they continued this work with a study on Jurassic feathered dinosaur fossils found in Liaoning Province, China.

While studying these specimens in 2009, the team believed they had found tiny structures called melanosomes in the fossils. Melanosomes are microscopic bodies found in animal cells. Their role is to transport the pigment responsible for the colour of skin and feathers. Other researchers were not convinced that these structures really were melanosomes, however, and claimed the structures could have been bacteria. In 2015 the team, together with Swedish colleagues, carried out a study which found the presence of melanin, the pigment responsible for colour, in the structures, demonstrating they were indeed melanosomes.

The key to interpreting the colour of dinosaur feathers is in the shape of these tiny structures. Researchers were able to link the shapes found in the fossils to melanosome shapes in modern-day birds, which make their feathers one of four or five different colours.

The origin of… leaves

Way back in the Palaeozoic, the landscapes on Earth were barren and hostile. No trees, no leaves, no roots as we know them. Plants had been evolving underwater. Once they started to survive out of the water, the evolutionary race was on to compete for the available resources, and only the best adapted plants could survive. **At the beginning of the Devonian period, an explosion of plant life began to take over the land. But how exactly did these plant ancestors evolve to develop complex architecture, with leaves and seeds like the plants we know today?**

400 million years later, a retired florist brought a fossil into the Royal Belgian Institute of Natural Sciences. He'd chanced upon it in in the Belgian countryside around Marche-en-Famenne, and spotted some interesting-looking shell shapes.

26.06

Elke Sleurs, Secretary of State for Science Policy, releases an additional budget of €1,019,000 for large-scale maintenance of the national oceanographic research vessel RV Belgica and €829,000 to buy high quality digitisation equipment to allow our type specimens to be consulted and studied easily from anywhere in the world.

The Institute's palaeobotanist noticed something much more important – two very well preserved plant specimens which shed light on how plants evolved.

This find joined a bank of evidence which helped researchers see **how primitive plants evolved in two directions, towards ferns and towards seed plants.** In their common underwater ancestor, most of the plant's structure was devoted to producing spores, in order to reproduce and spread. The variant of this ancestor which notably evolved into seed-bearing plants started to sacrifice parts of its structure for other purposes. **From these fossils we see the organization of the plant's primitive organs,** which we know later evolved into branches and leaves in modern-day seed plants. The PASTREE project, funded by Belspo, allowed researchers from the Institute to work with colleagues from the University of Liège to take this work further over a two-year period, looking at similar specimens from South Africa and Argentina which also show how evolution led towards the first seed-bearing plants, 20-30 million years later.

The next step for the team is to understand how forests first started to spread across the land during the Mississippian period, which followed the Devonian. The Institute's collection contains specimens which cover this period completely, providing extremely valuable insight.

The origin of… red teeth

Transylvania may be better known for another inhabitant whose teeth were red with blood. But researchers at the Institute discovered one that was around a lot earlier, and whose teeth were red for very different reasons: **a 70 million year old *Barbatodon transylvanicus*, the oldest known red-toothed fossil mammal** and whose skull is the most complete mammal fossil from the Upper Cretaceous period in Europe.

The rat-sized specimen was unearthed in 2004 in Pui, Romania, by the river Barbat. In the Cretaceous period, southern Europe was a series of islands, which were often interesting from the point of view of evolution, since primitive species survived longer there than on the continent.

Working together with the team at the University of Babès-Bolyai in Cluj-Napoca, Romania, our team described the species. At first, they assumed the blood red colour of the teeth was due to the colour of the sediment in which the skull had been found. But using an electron microscope, they discovered that **the red in its teeth actually comes from iron in the tooth enamel -** spectrometric analyses of the enamel showed it was composed of almost 7% iron. This strengthened and protected the teeth, and the long front incisors in particular, making the animal well adapted to eat hard food like grain. We know that this species could not regrow its teeth, so it was particularly important to prevent wear and tear.

Iron is also found in the teeth of modern-day rodents and shrews, for the same reasons. However, *Barbatodon transylvanicus*' family, the Multituberculates, died out. Even if they survived the mass extinction at the end of the Cretaceous period and major global warming, lasting an impressive 150 million years, their line nonetheless came to an end 35 million years ago. We can therefore see that **the reappearance of red teeth is not a case of family connections, but an example of evolution coming up with the same adaptation, millions of years later.** The same adaptation has also evolved in butterflyfish for example, that feed on hard coral – their teeth are capped with iron for protection.

10.07

Bart Tommelein, Secretary of State for the North Sea, comments positively the strong cooperation between the Defence, Science Policy and the RBINS, on his observation day on board the RV Belgica.

21.07

Strudiella devonica, one of the oldest insect fossils and 70 other specimens from our collection are exhibited at the Royal Palace for the exhibition Insecta, the kingdom of insects.

1000-year old case of **mistaken identity**

Relics of saints are worshipped in holy sites across the world, and Bruges is no exception. At the chapel of the Our Lady of the Potteries abbey, the bones of Blessed Idesbald, a Cistercian monk and abbot of the Ten Duinen abbey, are preserved in a lead coffin.

Or are they? In 2015, the lead coffin was opened up for the remains to be studied. A multidisciplinary team got to work, including the Institute's anthropologist, alongside other experts who carbon dated the bones, studied the coffin itself and worked on the textiles within it.

The result was something of a shock: these bones did not belong to Idesbald at all. The carbon 14 dating very clearly showed that the bones dated from between 1470 and 1623. Idesbald died much earlier, in 1167. Thanks to the work of the Institute's anthropologist, it also became clear that the bones did all belong to the same individual – a man aged around 50, whereas Idesbald probably died in his 60s or 70s. The question remained: if this was not Idesbald, who was it?

The team identified three candidates: abbots whose bones would have been around the right age, and who died at approximately 50 years old. The Catholic University of Leuven is now launching a DNA project to discover which abbot the bones really belong to. The team put a call out for people living locally who could trace their family tree that far back. Thanks to the technology of the DNA identification, the team can use samples of a relative of each abbot to match the bones.

Disturbing discoveries in ancient Egyptian graves

When we think of the ancient Egyptians' relationships with wild animals, we tend to think of animals that were revered as holy. However, a team of Belgian archaeozoologists has found wild animals in ancient Egyptian graves that show signs of a much darker side to how animals were treated.

The Institute's specialists have been working on the elite Predynastic cemetery in Hierakonpolis for more than ten years now. The cemetery dates from around 3800-3100BC, and as it turns out, was not just a site for burying the human dead. Archaeologists found the remains of over a hundred domestic animals like sheep and cattle, and 38 wild animals, including baboons, crocodiles, elephants, hippos and a leopard. The research, funded by the British Museum and Friends of Nekhen, shows that **many of the animals show signs of being injured in captivity as a result of tethering or punishment.**

One hippopotamus had a healed fracture on the fibula of its back leg, indicating that it had been tied to a tree and had injured itself whilst trying to escape. On the baboons, the team identified what are known as parry fractures – injuries that occurred when the animal was defending itself, for example, broken forearms from when the baboon was covering its head for protection. It seems that **the animals had two different symbolic functions: the numerous domestic species indicated wealth and excess, while the wild animals were status symbols.**

01.09

Ten new postage stamps drawn by comic strip artist Conz portray "Belgian" dinosaurs, including Bernissart Iguanadons Olorotitan and Aurornis.

2 COLLECTIONS

Quality management for our unique collection

37 million specimens. Unique treasures such as the Bernissart Iguanodons, the Spy Neanderthals, the Dautzenberg shells. As one of the world's largest, our natural history collection takes some serious work to maintain and manage. **In 2015, the Institute obtained certification known as ISO 9001 for the quality of its collection management.** This achievement reflects years of effort to ensure the collection continues to open up access to its wealth of potential.

In 2013, the Institute set up a specific unit devoted to maintaining and promoting its collections: the Scientific Service Heritage. This was an essential step to improve the management of the collections and archives. Each of the six main collections has a specific scientific curator: entomology, recent invertebrates, recent vertebrates, anthropology, palaeontology and geology. Each coordinates their work on digitization, research on curation processes and techniques, improving quality management systems, links with amateur scientists, storage and the management of big data sets.

Around the same time, CETAF, the Consortium of European Taxonomic Facilities, was drawing up a Code of Conduct for Access and Benefit-Sharing, which outlines a set of European principles for collection management. **The CETAF guidelines were in part a response to the implementation of the Nagoya Protocol**, a global response to the need to ensure fair and equitable use of genetic resources from specimens collected worldwide. Debate around this topic brought up the concept of labelling "trusted collections" of which the biological resources must be properly traced. This was the trigger to ensure the collection regulations conformed to a more formalized and better recognized procedure. To obtain ISO certification, the Institute needed to look at the various procedures and practices that each of the six collections had been following individually, and build more uniform procedures and practices.

A quality management system certification process was therefore put in place in order to ensure uniformity among collection management documents. This procedure improves the acquisition, the documentation, the conservation and the valorization of the collections, allowing knowledge to be managed and shared more efficiently. The process of course meant a lot of additional work for the team, but the client-oriented focus ensures that the collection better meets the needs of its end-users: researchers and museum professionals both within and external to the Institute. The more the collection is accessed by stakeholders, the more research can be done on its specimens, and the greater the potential outcomes for the advancement of science. In this way, the improvement in our collection management can truly help to improve our unique collection's position in the world.

09.09

The *Gallery of Humankind, our evolution, our body* wins third prize at the International Design and Communication Awards (IDCA) for its creative, innovative and efficient scenography.

Stepping up to **the challenge of Nagoya**

The concept of piracy is not limited to bandits on the ocean waves, or teenagers sharing their favourite albums online. Biopiracy is a serious concern for developing countries, who have a wealth of genetic resources at risk of being exploited by others. Without regulation, bioprospectors would be free to take indigenous knowledge of medicinal plants for example, and sell it on to pharmaceutical companies who then patent this knowledge, with no benefit whatsoever to the indigenous people. How can we ensure that the benefits of these resources are shared in a fair and equitable way?

To address this issue, the Convention on Biological Diversity was agreed in Rio in 1992. Enshrined in it is the concept that every state's biodiversity is a sovereign right. Since then, developments in international and national legislation have created a new, more equitable framework for collecting and using specimens internationally. **A crucial step in this process was the Nagoya Protocol** which addresses the issues of access and benefit sharing specifically. The Institute participated in its negotiations in Nagoya, Japan, in 2010. In order to avoid conflict, countries must inform each other about how specimens are gathered and where they will be stored. The protocol defines the shape this information should take, and how the process should be implemented. It was signed and ratified by 50 countries including Belgium, and as of the end of 2014, the Institute complies with the protocol in full.

What does this mean for the Institute's daily work? Every specimen entering the collection now needs a permit to ensure that it complies with the Nagoya Protocol. These permits are not always easy to come by, as researchers from the Institute found when they planned a trip to the wetlands of South Africa to collect algae and echinoderms. Specimens were to be collected from iSimangaliso Wetland Park as part of a research project involving the University of Gent, the Royal Museum for Central Africa and the University of Cape Town. The details of the permits vary from country to country. In this case, four permits were required from two different government departments. The Institute's team had to give a lot of information in advance about what they would collect, and negotiation was necessary in order to find an agreement. Once all four permits were finally obtained, the documents had to be carried with the researchers at all times while on location, ready for any checks that took place, to ensure the material could be brought back to Belgium.

Obtaining permits is therefore a time-consuming process. However, this is a positive step which improves access to research results and ensures no country loses out. One challenging consequence for the Institute's collection is that in the future, when amateur collections are donated, we will be unable to accept them unless permits have been obtained. Whether or not some kind of retroactive permit may be possible is a question that is currently up for discussion.

11.09

Commander Luc Van Tricht handed command of the oceanographic research vessel RV Belgica on to Lieutenant Bernard Tabureau in Temse, the town where the ship was built.

17.09

For the 20th anniversary of the Brussels Museum Council, the Museum is awarded the **Brussels Museum Council Award for the most dynamic museum.**

A wish come true in the iguanodons' cage

Looking up at the iguanodons in the Museum's dinosaur gallery, it is striking to see how meticulously the palaeontologists have worked on each skeleton. However, they are fragile and careful rules have to be put in place – **no member of the public is ever allowed to enter the iguanodons' cage**, for example. That said, sometimes even palaeontologists break the rules.

When the Make-A-Wish Foundation got in touch with the Museum, the team were keen to work together to make this request possible. The wish came from Rose, a young girl with a terminal illness who was crazy about dinosaurs. The Museum's educational service immediately got in touch with the curator of these collections to discuss the possibilities. Normally, only visiting researchers would be permitted to touch the iguanodons, and not without the correct permits and applications. When we breathe on the fossilized bones, pyrite crystals in the fossils react with the humidity in our breath, eventually causing the skeletons to crumble.

On Tuesday 23rd June, Rose and her family arrived to a warm welcome and a full tour from the team, and her enthusiasm for the dinosaurs was immediately apparent. Once inside the iguanodons' cage, the guide took a toe from an iguanodon skeleton for her to hold. "Can I really touch the toe?" It was a moving event for all concerned, and a reminder of the magical way that natural history can move us and inspire us, at some of the most important moments in our lives.

A thrifty innovation bringing specimens into focus

In tough economic times, innovators can be obliged to work within a budget. But **sometimes low-cost innovations can outperform even their priciest counterparts**. Researchers working on the Institute's digital collection have come up with a unique set-up to take photos of specimens, achieving recognition with an impact factor in the journal *ZooKeys*.

The resulting quality is better than high-end solutions, and at just a tenth of the price of current systems.

Digitisation is a time-consuming but necessary process, in order to open up worldwide access to the Institute's particularly rich natural history collection. It means fragile and valuable specimens do not always need to be shipped or manipulated for research purposes. This new system allows researchers to take high quality pictures much more easily, making it ideal for mass digitisation projects. It was developed in the context of the Agora 3D Project and DIGIT03 funded by Belspo and the European FP7 SYNTHESYS 3 program.

The technique is known as focus stacking: shooting many pictures with different focus ranges in order to ensure that the entire subject appears in focus in the final photo. It has been available for some time as a high-end product, but this is the first time researchers have produced it with consumer-grade materials, and with such high-quality results. The stunning results are available for all to see on *virtualcollections.naturalsciences.be*.

26.09

The quirky urban adventure race for women, 'Pop in the City' stops behind the scenes in our Vivarium: 180 of the 680 participants faced their phobia of insects.

01.10

Being a researcher does not mean you cannot be a successful blogger at the same time! The blog *quakerecnankai.blogspot.be* is a project funded by Belspo combining fieldwork and modelling to study tsunamis and earthquakes in the south of Japan. A year after its launch, it has already been visited 10,000 times!

3 PUBLIC

The new Gallery of Humankind
Our evolution, our body

From *Sahelanthropus* to *Homo sapiens*, from embryo to adult: the Museum's newest gallery opened in May 2015, and it was truly a team effort. This spectacular permanent exhibition links two very different kinds of transformation: the human body over our lifetime, and human evolution over the millenia. The Museum has combined this thoughtful approach with its unique in-house expertise in order to bring together a visitor experience which has been particularly well-received by its audiences.

Visitors entering are greeted by Lucy, a 3D model of the 3.2 million year old hominid just 1m10 tall. Looking around, we see she is not alone – **the exhibition brings together 25 hominids from across history, with 15 recreated in 3D and virtually reconstructed by the Museum team**. Toumaï, the *Sahelanthropus tchadensis* and the famous Belgian discovery, the Man of Spy are present too. We learn that up to four of these 25 hominid species lived on Earth at the same time - evolution was not linear and as *Homo sapiens* we are the outcome of a complex and branching process.

What sets us apart from our ancestors? In the second space we explore our four major adaptations – walking on two legs, dexterity, larger brains and smaller teeth. Interactive stations allow us to test out these adaptations for ourselves. Finally, we look at the life stages we go through, from the fertilisation of our mother's egg, through birth and childhood to adolescence, adulthood and old age. Highlights include a collection of foetuses preserved in formalin for 100 years, intricate plastinated organs and stunning projections on life- size models to illustrate pregnancy, the body in movement and the nervous and digestive systems. Interactivity is again at the heart of the experience, including a Kinect game, association test and group pressure station, among others.

The museography of the space is striking – upon entering, a hush seems to fall across visitors as they explore, and they seem drawn to engage each other in conversation about the topics raised. This atmosphere was recognized by judges in the **International Design and Communication Awards 2015,** who awarded the gallery bronze in the category **Best Scenography for a Permanent Collection**. The Museum was nominated for the European Museum of the Year Awards and the gallery won the second prize "**Highly Commended**" of the **Museums and Heritage International Award 2016.**

The poster for the exhibition also drew some press attention, as a debate began as to whether the portrayal of hominids alongside each other gave an impression of racial stereotypes. The Museum team was happy to point out that the red-headed hominid perceived as a modern-day white man was in fact a Neanderthal, and that the representative of our current species on the poster was the Egyptian man next to him, as museum guides at the gallery explain. The Museum planned a community action to follow up on the debate.

With the Gallery of Humankind, the Museum marks another successful cooperation, and particularly notable the extent to which the content and design were produced in house. It is the source of a great deal of pride among the team at the Institute.

10.10

For its first edition, the Festival Artonov sets a Jurassic Carnival among the dinosaurs, a musical performance inspired by Saint-Saëns with lyrics written by Bruno Coppens.

An exhibition with the **WoW** factor

Since October 2015, visitors arriving at the Museum have been greeted with a breathtaking sight: a herd of ibex leaping from rock to rock above our heads. This freeze frame is made all the more spectacular by the fact that the whole herd of animals is only attached to the rock by the foot of a single creature. The artistry of the taxidermy is as impressive as the beauty of nature in movement.

The ibex are just a taster for what is in store for visitors to the *WoW-Wonders of Wildlife* exhibition, shown at the Museum from October 2015 to August 2016. We find ourselves caught in stunning real-life snapshots taken straight from the natural world. A wolf chases boar, while a tiger leaps majestically and lions hunt zebras on the run. **The aesthetic of the exhibition packs a punch, piquing our curiosity and encouraging us to learn more about animal behaviour, biomechanics and conservation.**

A number of key partnerships helped to ensure the exhibition's impact. *WoW-Wonders of Wildlife* was a co-production with the Parque de las Ciencias in Granada, Spain. The WWF was a partner for the development as well as promotion of the exhibition, and a number of media partnerships were drawn up. The press were drawn to the taxidermy expertise which was demonstrated by the Museum's team live at the opening, as well as the set-up of the exhibition itself, with images of the animals being unwrapped and set into position. **The success of the exhibition is reflected in the excellent visitor numbers, as well as in the looks on people's faces as they enter.**

Behind the scenes at the Museum - live

A lot of what goes on behind the scenes at the Museum – taxidermy, dissections, work with poisonous animals – is as fascinating as what is on display to the public. In 2015, the Museum took the opportunity to turn itself inside out, allowing the public a glimpse of what normally happens behind closed doors.

Every year, Brussels museums open late for a reduced price and a special atmosphere, every Thursday evening during autumn. In 2015, the 15th year of the Nocturnes coincided with the opening of the spectacular *WoW-Wonders of Wildlife* exhibition. Since the exhibition called for extreme taxidermy, it was an opportunity to show the public all the work that goes into creating these displays. Two professional taxidermists worked live on birds during the Nocturne, allowing people to see their techniques from up close. Something about this expertise in action live really left people open-mouthed. The event drew over 700 visitors, many more than the usual Nocturne events.

For World Ocean Day in June, a public porpoise dissection was organised, drawing over a hundred people. Witnessing a live dissection is something that only places like museums can offer, and the appetite for this type of live science is very clear.

This fascination was part of the reason behind the decision to open up a window onto a vivarium of real poisonous animals for the Poison exhibition, opening in October 2016. The public will be able to see the Museum's technicians work with the animals live.

19.11

To limit his ecological footprint while travelling, our biologist colleague Henri Robert leaves to the COP 21 in Paris… by canoe. This is a way of making a splash to raise awareness of the issue of climate change.

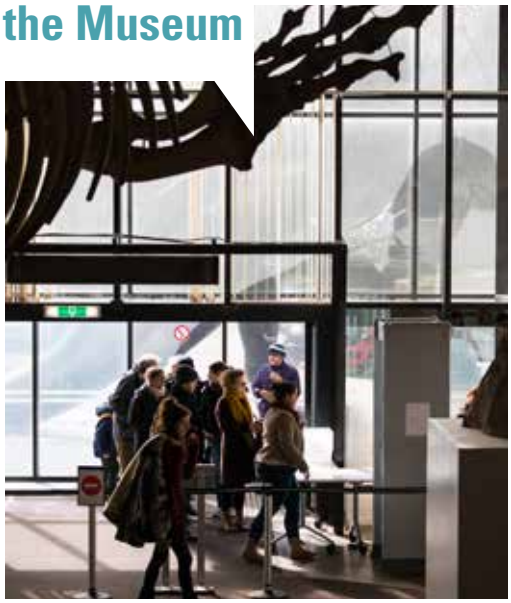
A doll's house perspective on **household minerals**

Mineralogy is not the easiest of topics to bring to life for a young audience. Thanks to an innovative doll's house design, the Museum's team was awarded by the Brussels-Capital Region for its children's workshop "Domestic minerals", which looks at the minerals around us at home, from a unique perspective.

The doll's house is over a metre and a half tall, contains six tiny rooms and was built entirely by the Museum team, in house. A search of each room reveals three minerals hidden in plain view, from the halite (rock salt) that we shake onto our fries, to the kaolinite in the plates underneath them. Each of the minerals has a specimen from the Museum's collection associated with it, so the children can discover the form in which each mineral is found naturally. A guide from the Museum presents the house in a workshop setting, allowing them to touch and turn each room, and ask their questions in a cosy setting. The main challenges of its design were to ensure quality and durability, as well as ensuring that accuracy was not compromised for the aesthetics of the exhibit.

The prize from Innoviris is known as "When I grow up I will be… Marie Curie or Einstein!" and was awarded by Fadila Laanan, Secretary of State for Research for the Brussels Capital Region. It is actually our second win in a row, after 2014's workshop "Humankind, its origin, how it works" designed to accompany the opening of the Gallery of Humankind. The "Domestic minerals" workshop opened to Museum visitors in April 2016.

Lockdown at the Museum



The week of the 21st November 2015 was a difficult one for the city of Brussels. Following the tragedy of the terror attacks in Paris the previous week, the government of Belgium imposed a security lockdown on the capital. Shops, schools and public transportation all closed due to information about potential further attacks. The terror alert level was raised to maximum across the Brussels metropolitan area. The atmosphere in the city was tense.

The entire Institute closed its doors to the public and staff accordingly on the 21st, and while we reopened to staff on the 23rd, the Museum remained closed to the public. This was communicated clearly on the website, in the press and through social media networks. The director of the Institute worked closely with the other federal museums, the federal administration and cabinet for Science Policy to establish a coherent security strategy in order to reopen to the public.

The result was that the Museum's doors opened again on Saturday 28th November, sooner than some, with a metal detector and security staff at the door. Despite these complications, both the Museum team and visitors were remarkably cooperative. During the lockdown we can estimate we had around 8,000 visitors fewer than the same period in 2014, with 128 school groups cancelled, and that the *WoW* exhibition took a little longer to find its audience. However, we soon saw that the cancellations rescheduled in 2016, boosting visitor numbers once again, reassuring us that we maintained our visitors' trust.

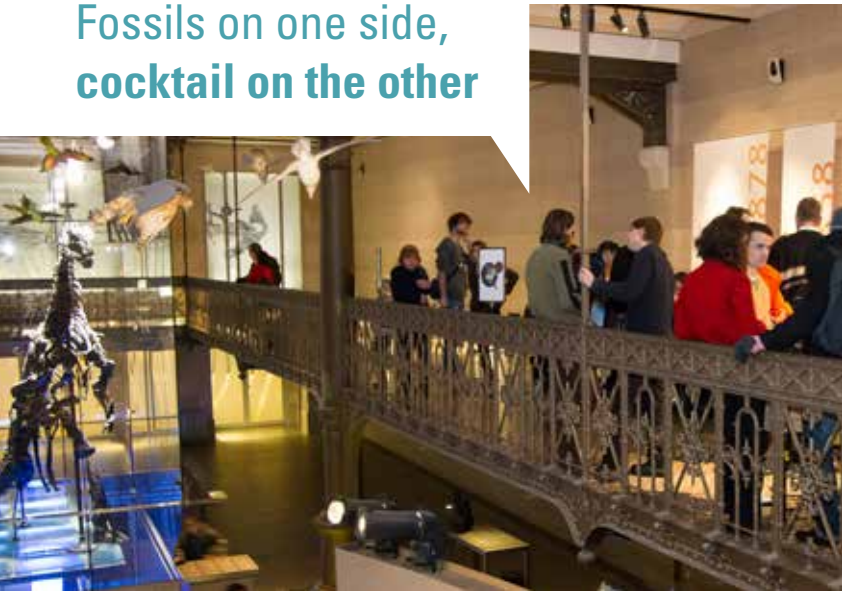
26.11

The Minister of Development Cooperation, Alexander de Croo, opens the symposium "Biodiversity and development, a global Heritage" as part of the RBINS' CEBioS programme. He highlights the value of recognizing and protecting biodiversity and insists on the importance creating and reinforcing local capacity on the topic, to support development and reduce poverty.

28.11

After a week of closure due to alert level 4, the Museum reopens to the public with new procedures in place for better security conditions.

Fossils on one side, **cocktail on the other**

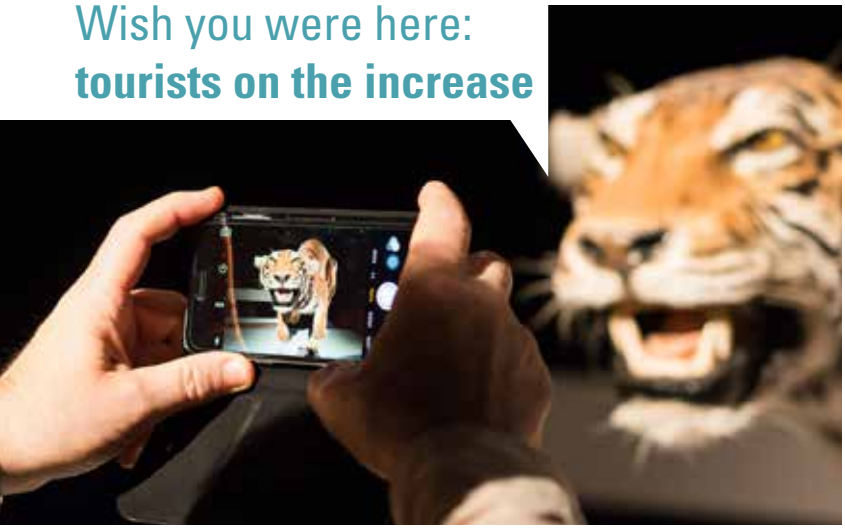


When people talk about their experiences in the Museum, there's one word that always comes up: atmosphere. There is something elusive that makes it a captivating space, beyond its spectacular exhibits, museography and architecture. As a result, the demand to hold special events in the Museum is increasing, and the team goes that extra mile to make each one a success.

One-off events in 2015 brought some unexpected visitors to the museum. The voice of Scottish soprano superstar Susan Boyle echoed out around the iguanodons for the 2015 .eu Awards Ceremony. Google transformed the Museum's reading room into a classroom of the future, to discuss digital skills with decision makers from the neighbouring European Commission and Parliament. And for the Festival Artonov, the dinosaur gallery became a Carnival of the Animals, with a performance of the Saint-Saëns classic. In total, 68 events were held, of which 24 organised by the Institute and 44 for external clients, from formal academic conferences to social cocktails. For the Museum, these events are valuable not just as a source of income: they help to raise our profile internationally.

New faces often lead to new collaborations, helping to shape the Institute's profile not only as a Museum but as a space where researchers, policymakers, artists, the general public and stakeholders from a whole range of fields can come together to be inspired by the history of the natural world around us. It is this diversity of profiles that helps create the Museum's unique atmosphere, too.

Wish you were here: **tourists on the increase**



The Museum's visitors have always been mainly schools and families. But in 2015, a new strategy in communication has resulted in a significant increase in a different visitor group: tourists in Brussels. Between 2013 and 2015, **the numbers of foreign tourists visiting almost doubled,** with particular increases from France, Italy, Spain, Germany, the Netherlands and the UK. What is behind this leap in the figures?

In 2012 the Museum joined "Club City Break", an initiative of the Wallonia-Brussels tourist board. This concept takes **a participatory approach,** in that for every cent that the members of the club invest, the board matches it with an equal investment. This enables all members to work together to reach foreign markets that would be unaffordable on their own, using an approach known as affinity marketing.

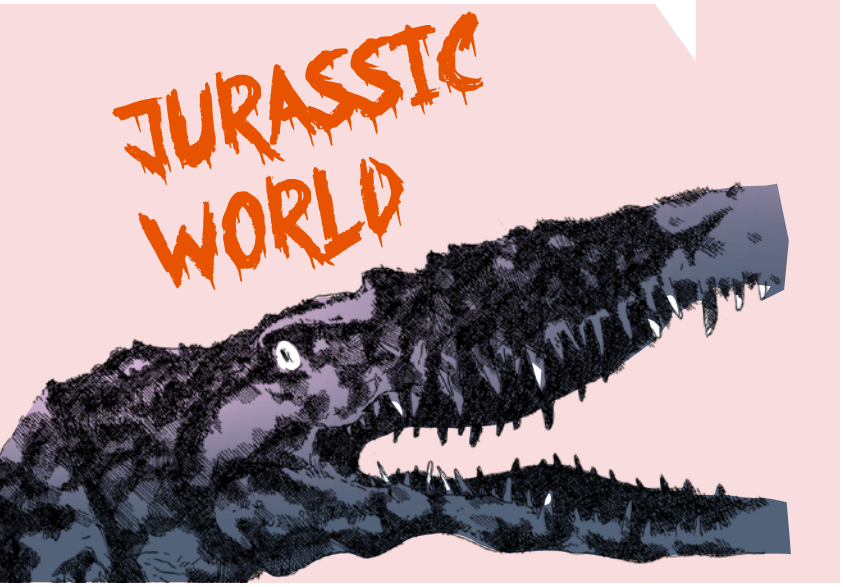
Affinity marketing reaches new audiences more effectively by looking at groups of people with common interests, rather than breaking audiences down by socio-economic background. For the Museum, this involves a focus on families, couples, and groups in countries bordering Belgium. The Institute is also represented on a board of experts for strategic reflection for tourism in Brussels.

These factors, combined with an overall increase in tourism in Brussels during this period, have certainly contributed to the Museum's success with tourists. The team is proud of the results so far, which mean that all the Museum's strengths meet a more global audience.

10.12

The Belgian Bird Ringing Centre, a service of our Institute, launches a new website, BeBirds (odnature.naturalsciences.be/bebirds), where you can follow the migration of over 270 species of bird. The site takes its data from our wide network of volunteer 'ringers' which has been running since 1927. The site is open to all and is a nice example of citizen science.

The truth about Jurassic World



Jurassic World may have been one of the biggest films of the year, but it was certainly not one of the most scientifically accurate. Nonetheless, **the buzz around dinosaurs gave the Museum the opportunity to bring in some facts alongside the fiction, just a month after the Museum had been named one of the best in the world for dinosaurs by CNN.**

The links with the film were very clear. The mosasaurus feeding scene is one of the most memorable from the film, as the aquatic dinosaur surges up from the water, its jaws closing around the shark dangling above. The Museum's Mosasaur Hall happens to be one of the world's most impressive collections of that same family of dinosaur, including the 12.5-metre-long Belgian specimen, *Hainosaurus bernardi*.

The Museum contacted the distribution company early for a list of the species mentioned. As a result, a special booklet was produced for children to guide them through the Museum's specimens mentioned in the film. Tickets for both the Museum and the film were made available in a special package.

Jurassic World had a huge impact in the press, and it was interesting to see the appetite for real science as well as the spectacle of the film. Several newspapers published long articles which featured experts from the Museum much more heavily than the film itself, reporting on the Institute's latest paleontological discoveries. This allowed the Museum to position itself very nicely, allowing families to discover the real story of the dinosaurs.

From the lab to the newspapers: **research in the media**

The Museum has always gained great coverage in the press. More challenging is ensuring the Institute is better represented, so that the excellent research that is carried out there is recognized by the public, as well as by professionals. **2015 was a good year in terms of communication**, with over a thousand mentions of our museum activities and our research in the national and international press.

How has our team made this possible? In 2015, our communication officers sent out more press releases on scientific topics (30 in total; up ten from last year) and published 50 news articles on our website concerning our research (16 more than in 2014). **Usually the texts are ready-to-use**, offering quotes of the researchers involved, attractive visuals, and so on. And the team always warmly invites journalists to meet our scientists. Now almost half the articles on our research quote the researchers directly.

The communications team has also made a point of adapting for today's media environment, where behind-the-scenes images and videos are often what goes viral. One researcher recently drilled into the skull of the Goyet Cave Dog in order to extract DNA, and a quick smartphone video soon lit up the Museum's Facebook page. It's a question of finding an angle that touches people online and in the media, inspiring them the way the Museum does in person.

22.12

Just 4 years after its launch, the *European Journal of Taxonomy* (EJT) obtains an impact factor, despite taxonomy often being considered as an old-fashioned field. The online journal is completely open access, co-edited by six natural history museums and published according to the international standards.

4 FIGURES

FINANCES

There is more to the financial balance for the year than meets the eye. A surplus of €1,876k gives the impression this was an exceptionally good year for the Institute. This is true in a way, but not in a structural sense.

The revenues are boosted by one-off grants totalling €2 million, as part of our Secretary of State's investment plan. What is more, the annual transfer of €1.2m for the cooperation programme was made twice in the same fiscal year, due to a specific funding schedule. Without these exceptions, our total income would come to just over €30m and not €33m.

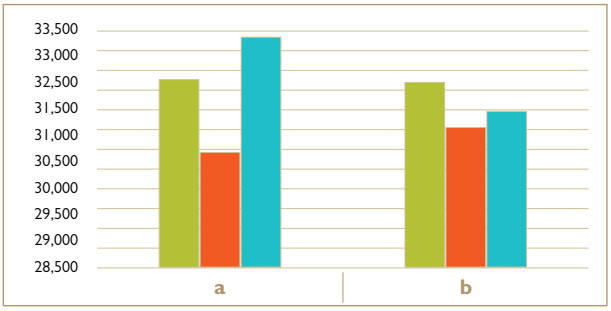
On the contrary, the budget made available by Belspo for statutory staff and certain contracted agents (one-off and temporary contracts) drops by 7.5%. This significant decrease is due to political decisions (a 2% cut in personnel allocation) but also due to administrative procedures which overestimate the cost of recruitment, effectively blocking our recruitment plan. At the same time, personnel expenses related to internal resources increases by almost 6%. The constant search for new resources mainly aims to maintain our main capital: people.

In terms of spending, in settlement credit, the figures are also skewed by the delay in payment of two quarters of the Belgica's functioning, totalling €1.294m, put off until 2016 due to late billing from the Ministry of Defence, as well as two projects from our Secretary of State's investment plan (the purchase of microscanners for digitalising collections and a tender for security of the public spaces totalling €1.14m).

Taking account of these technical elements, the financial reality ends up as a negative balance of around €1.75m, which corresponds to the €1.69m total invested in the renovation of the museum.

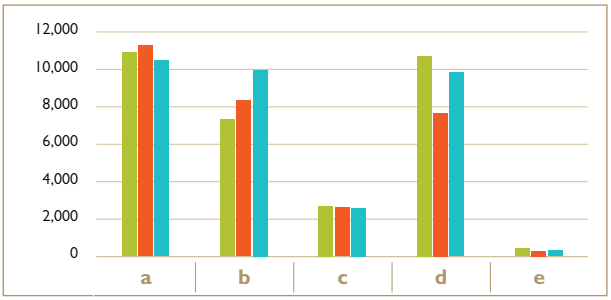
INCOME AND EXPENSES (IN €k)

	2013	2014	2015
a Income	32,288	30,452	33,360
b Expenses	32,217	31,080	31,484
Balance	**71**	**-628**	**1,876**



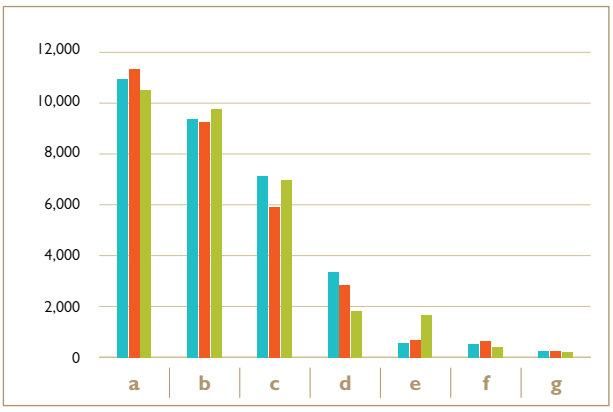
SOURCES OF INCOME (IN €k)

	2013	2014	2015
a Staff budget*	10,938	11,321	10,487
b General grant	7,358	8,376	10,000
c Museum's own income	2,752	2,691	2,651
d Research's own income	10,746	7,705	9,856
e Various own income	494	359	366
Total	**32,288**	**30,452**	**33,360**



SOURCES OF EXPENSES (IN €k)

	2013	2014	2015
a Staff budget*	10,938	11,321	10,487
b Staff expenses financed from own resources	9,347	9,231	9,765
c Ordinary operational expenses	7,134	5,941	6,960
d Operation flight equipment/vessels	3,376	2,875	1,869
e Investment in the Museum	592	739	1,702
f Equipment	546	685	448
g Library and collections	284	288	253
Total	**32,217**	**31,080**	**31,484**



* Extraordinary and temporary contractual staff at the expense of the Belgian Science Policy Office.

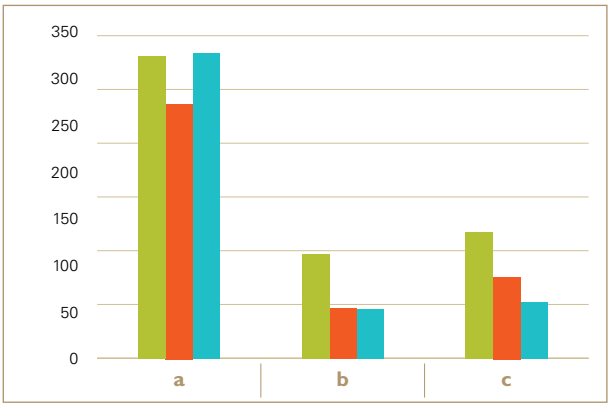
BREAKDOWN OF MISCELLANEOUS INCOME (IN €k)

Alongside large scale research and scientific service projects, the scientific departments bring in various revenue with their day-to-day activities (laboratory analyses, conference organisation, sales of geological maps etc).

Moreover, the Institute provides its staff with services which bring in revenue (social activities). Note that since the 1st January 2014, the Institute no longer has a creche, which explains the drop in revenue.

The general direction's income is made up of copyrights and administrative costs to third parties, etc.

	2013	2014	2015
a Scientific activities	280	236	283
b Social activities (mess, crèche)	97	47	46
c Management	117	76	53
Total	**494**	**359**	**382**



BREAKDOWN OF RESEARCH INCOME (IN €k)

The 2015 revenue from Belspo (€2,552k) must be compared with that of 2013 and not that of 2014. In 2014, a new billing system delayed certain revenues by half a year. Compared to 2013, the drop is close to 11% (9% compared to 2012). After another financial year we should know whether this is a general trend or simply fluctuations between the ends and beginnings of research programmes.

The increase in revenue at federal level (excluding Belspo) in 2015 is due to an advanced transfer of €1.2m (see the comment by the graph on revenue). In 2013, an exceptional subsidy came from the National Lottery for the purchase of an aerial surveillance radar which swelled the total revenue. The usual level of non-Belspo federal funding is around €1.4m to €1.5m. Belspo therefore remains the main funder for research by a long way.

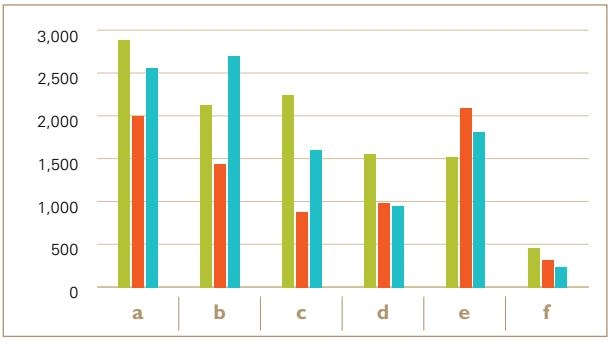
Revenue from the European Commission is stable. The 2013 figures were affected by an advance of €1.2m as part of a European project the RBINS coordinates. This explains the large difference between 2013 and 2015. As a rule, revenue in odd-numbered years is the double of that of even-numbered years. This is linked to the EC's reimbursement cycle. As such, the total revenue is not a reliable indicator of activity. As soon as the Institute takes the role of coordinator, it manages the partners' budget on behalf of the EC.

Federal entities' contributions are mainly for archaeology linked to natural sciences and North Sea monitoring. Revenues are down 3.5%. Between 2013 and 2014-2015, the significant drop in revenue from federal entities and the corresponding steep increase in private sector financing are due to a change in accountancy. Since then, the revenue linked to royalties has been considered private sector financing, even if it comes through the Flemish Region.

The major concern is with private sector revenue. New licensing for offshore wind turbines will not generate revenue until 2018. Monitoring activity is fundamentally balanced, but the decrease in revenue which began in 2015 will steepen in 2016 and 2017 before suddenly bouncing back in 2018.

Foreign sources of funding (public and private) are also down by 23.5%. This is likely to be an effect of austerity measures at European level.

Projects financed by	2013	2014	2015
a Belspo	2,873	1,990	2,552
b Federal administrations (excl. Belspo)	2,114	1,440	2,682
c European Commission	2,233	884	1,601
d Belgian federal bodies	1,550	983	948
e Private sector	1,516	2,083	1,808
f Foreign institutions (non-EU)	460	325	249
Total	**10,746**	**7,705**	**9,840**



BREAKDOWN OF MUSEUM INCOME (IN €k)

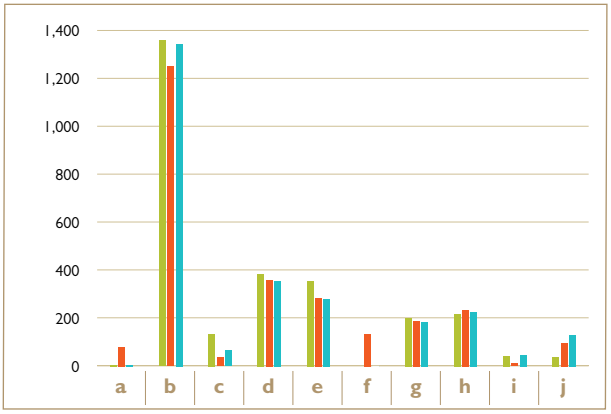
Attendance figures were greatly affected by the security issues at the end of the year. However, despite a 2% drop in visitors compared to 2014, revenues show a 7% increase. It should be remembered that the supplement for the Baby Animals temporary exhibition was limited to €0.50 instead of the usual €2 to compensate for the closure of many exhibition spaces. In 2014, this discount led to an average entry price of €4.08 compared to €4.47 in 2015.

	2013	2014	**2015**
a Museum renovation grant	8	82	8
b Ticket sales	1,356	1,247	1,340
c Exhibition hire and sales	137	39	68
d Shop	386	362	358
e Donations - sponsorship - grants	358	286	283
f Coproduction		136	0
g Educational Service	203	189	186
h Events	219	236	227
i Cafeteria concession	45	14	48
j User Observatory (all federal Museums)	40	100	133
Total	**2,752**	**2,691**	**2,651**

Revenues at the shop come to €358k (€362k in 2014). The average spend per client is rising (€15.33 compared to €14.86 in 2014). Profits in 2014 total €94k.

Revenue linked to the organization of events comes to €227k (down 4%). There too, many were cancelled at the end of the year.

In 2015 there were no major renovation works linked to BELIRIS funding. This will return in 2016-2017 for the renovation of the Convent wing.



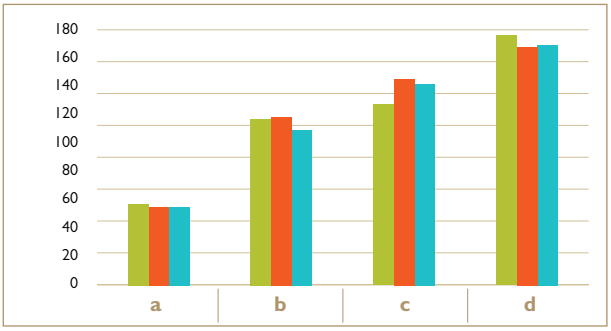
STAFF

The number of employees is on the decrease (422 agents versus 432 in 2014), a drop of 2.3%. The number of statutory scientists is stable, while the number of contractual scientists decreases slightly, by 2.3%. While the status quo is favourable in terms of statutory scientists, it should be emphasised that there are almost 10% fewer than in 2009. The erosion of the number of contractual non-scientists has eased after a steep drop of 16% between 2012 and 2014. The decrease is significant for statutory non-scientists, however, with 7.5% fewer.

For statutory staff, the relative numbers of scientists and support staff are stable. However, scientists' positions are also supported by external resources, through research or expertise, which is not the case for support staff. The latter are directly impacted by the drastic budget cuts. As a result, the support staff are the ones mainly decreasing in number. Scientists have represented a third of statutory staff consistently for four years. However they represent over 45% of contractual employees, compared to less than 40% in 2012.

STAFF BREAKDOWN

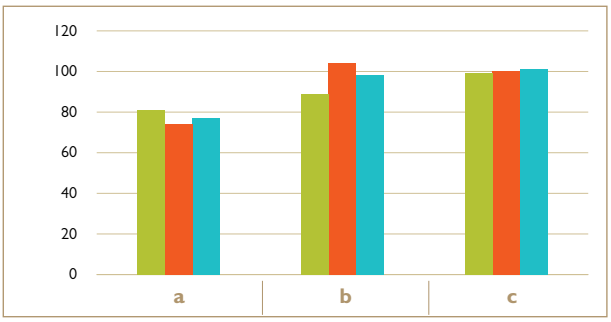
	2013	2014	2015
a Statutory scientists	51	49	49
b Statutory non-scientists	104	105	97
c Contractual scientists	113	129	126
d Contractual non-scientists	156	149	150
Total	**424**	**432**	**422**



SOURCES OF FINANCING FOR CONTRACTUAL STAFF

	2013	2014	2015
a Staff budget*	81	74	77
b Grant and ordinary income	89	104	98
c External projects	99	100	101
Total	**269**	**278**	**276**

* Extraordinary and temporary contractual staff at the expense of the Belgian Science Policy Office.

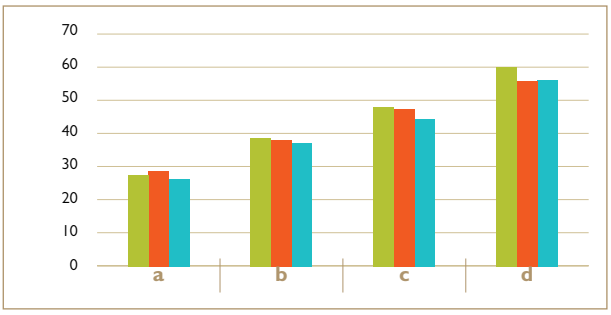


PERCENTAGE OF FEMALE STAFF

After constant progress until 2013, equality in the proportions of men and women continues to decrease. This is seen in all staff categories except contractual employees, but the drop is particularly notable among scientific staff, statutory or contractual.

This imbalance is also felt in management positions: the general direction and support services may be led by women, but the four positions of operational director are held by men.

	2013	2014	2015
a Statutory scientists	27.5%	28.6%	26.5%
b Statutory non-scientists	38.5%	38.1%	37.1%
c Contractual scientists	47.8%	47.2%	44.4%
d Contractual non-scientists	60.3%	55.7%	56.0%
Total	**47.6%**	**45.4%**	**44.8%**

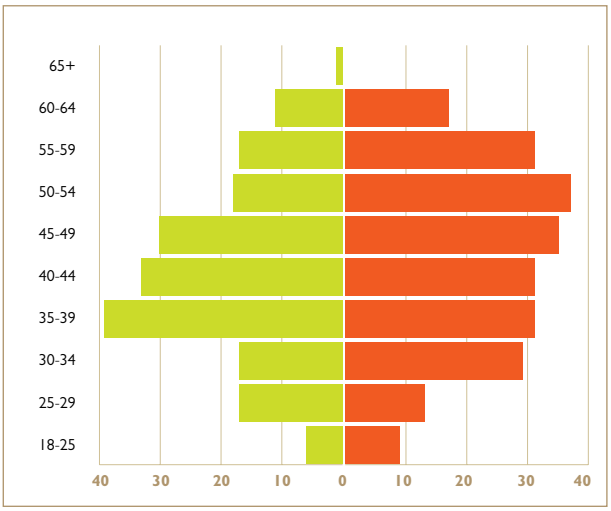


AGE PYRAMID

The average age of employees is 42 for women and 44 for men, in line with the previous year. More than 18% of the workforce consists of employees aged over 55 (18.5% in 2014). The magnitude of these figures demonstrates the importance of developing a real knowledge transfer strategy.

Even if men and women are equally well represented among staff aged 18-44, men account for almost two thirds of employees aged 45 and over.

	Women	Men
65 +	1	
60-64	11	17
55-59	17	31
50-54	18	37
45-49	30	35
40-44	33	31
35-39	39	31
30-34	17	29
26-29	17	13
18-25	6	9
Average age	**42**	**44**



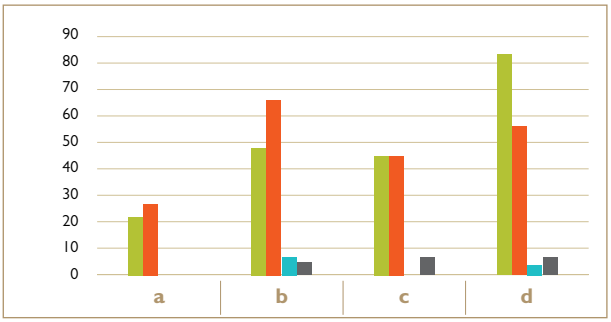
STAFF BREAKDOWN BY LINGUISTIC ROLE

As in 2014, we are close to linguistic parity (198 French-speaking employees compared with 193 Dutch-speaking employees). The number of Dutch-speaking scientific employees (57% of the workforce; 56% in 2014) and statutory employees (51.5% compared to 53% in 2014) is significantly higher. French-speaking employees represent 60% of non-scientific contractual employees.

Only 2.5% of employees are of foreign nationality.

The staff based in Ostend is not taken into account in the calculation of linguistic parity.

	FR	NL	For.	Ost.
a Statutory scientists	22	27		
b Contractual scientists	48	66	7	5
c Statutory non-scientists	45	45		7
d Contractual non-scientists	83	56	4	7
Total	**198**	**194**	**11**	**19**



ABSENTEEISM AND WORK ACCIDENTS

	2013	2014	2015
Absenteeism RBINS (%)	5.68	4.50	5.20
Absenteeism federal level (%)	5.57	5.71	nd
Work accidents RBINS (frequency)	14.69	13.65	6.83
Work accidents R&D (frequency)	2.11	2.54	nd
Work accidents Museums (frequency)	5.82	7.02	nd
Work accidents RBINS (number)	11	10	5
Accidents RBINS on the way to work (number)	8	9	15

The figures for absenteeism rose compared with financial year 2014 from 4.5% to 5.2%. We do not have comparative data available at federal public level in its entirety. The number and frequency (calculated based on private sector standards) of accidents at work, however, have halved. The number of accidents during the commute to or from work is steeply increasing, from 9 to 15. The majority of these accidents concern employees who commute by bicycle: our contribution to sustainable mobility…

RESEARCH

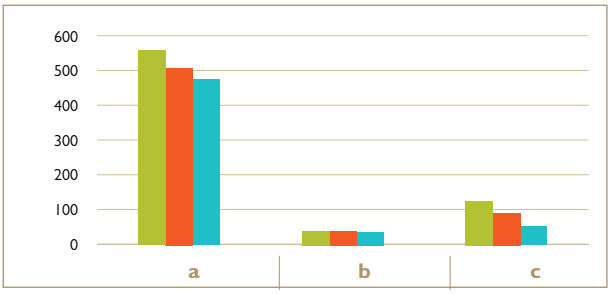
In 2015, we see significant differences to 2014 in terms of publications. Expert reports decreased markedly, particularly in earth sciences. Publications in high level journals, with impact factor, meanwhile, increased dramatically, particularly in biology (OD Taxonomy and OD Nature): 30% more than last year. These publications now represent over a third of the Institute's total, compared to a quarter last year. We cannot yet say whether these are cyclical variations or a trend.

There is however a certain continuity in the origins of these publications. OD Nature is still the main author of expert reports and OD Earth of popularisation works, where numbers remain stable.

Despite its small size with 13% of researchers, OD Taxonomy and Phylogeny remains the main author of scientific publications with impact factor or international editorial committee, constituting 38% of the total. OD Earth (28% of researchers) and OD Nature (42% of researchers) produced 25% and 30% respectively, compared to 11% in 2014 for the latter. In 2015, 25% of publications were open access, compared to only 15% in 2014.

PUBLICATIONS

	2013	2014	2015
a Scientific publications	555	505	474
b Popularisation	40	40	39
c Reports	126	93	55
Total	**721**	**638**	**568**



BREAKDOWN OF PUBLICATIONS

	Scientific publications				Popular works	Expert reports	Total
Operational Directorates	Total	*Peer review*	*of which journals with IF*	*of which others*			
Taxonomy and Phylogeny	202	*96*	*75*	*106*	4	2	**208**
Natural Environment	141	*74*	*67*	*67*	5	43	**189**
Earth and History of Life	190	*84*	*67*	*106*	26	9	**225**
Scientific Service Heritage	23	*16*	*12*	*7*	7	1	**31**
Total RBINS*	***474***	***260***	***205***	***214***	**39**	**55**	**568**

* Due to the cooperation among ODs and services, the sum of the parts may be greater than the total.

SCIENTIFIC PROJECTS WITH EXTERNAL FUNDING

In 2015, the number of contracts which the institute managed, alone or with another organisation, amounted to 153, 5 fewer than in 2013.

The Directorate Natural Environment, which focuses on topical environmental issues, naturally ensured a significant proportion of expertise and research contracts (52%).

	Projects with external funding
General Direction	2
OD Public Services	2
OD Taxonomy and Phylogeny	23
OD Natural Environment	80
OD Earth and History of Life	35
Scientific Service Heritage	11
Total	**153**

BREAKDOWN OF CURRENT PROJECTS ACCORDING TO SOURCE OF FINANCING

Research funding is mainly granted by the federal government (53% of resources), then by the private sector, the European Union and federal entities, in order of amount. The private sector mostly funds expertise studies, mainly in the framework of marine monitoring.

	2013	2014	**2015**	**2015**
	Number	**Number**	**Number**	**Amount (in €)**
Belgian Science Policy Office	60	65	65	2,596,965
Federal funding from other sources	13	10	11	2,661,900
National Lottery	2	4	3	19,625
Federated Enteties	18	23	23	1,074,895
Universities	6	1	2	0
European Commission	40	35	32	1,600,900
International	15	12	13	248,311
Private sector	5	8	8	1,807,725
Total	**159**	**158**	**157**	**10,010,321**

SUPERVISION OF STUDENTS

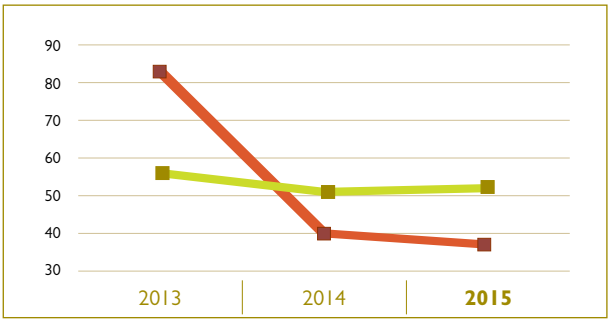
Supervision of undergraduate, PhD and masters students remained constant from 2014 but is still significantly down (-35%) compared to 2013. The supervision of PhD students is constant, but the investment in masters students is lower, confirming the 2014 trend.

The Directorate Earth and History of Life and Directorate Taxonomy and Phylogeny are responsible for 91% of the supervisory work.

It is worth noting that we have only included dissertations that are supervised, wholly or jointly, by one of the Institute's employees.

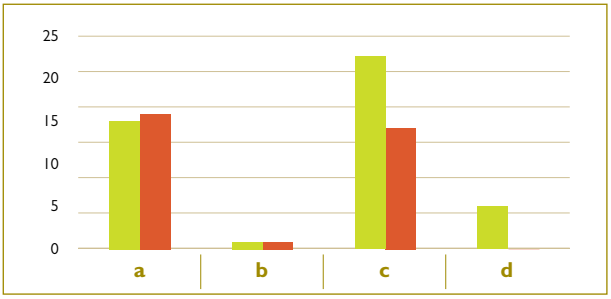
CHANGE IN SUPERVISION OF STUDENTS

	2013	2014	**2015**
PhD	56	51	52
Master	83	40	37
Total	**139**	**91**	**89**



BREAKDOWN OF THE SUPERVISION OF STUDENTS

	PhD	Master	**Total**
a OD Taxonomy and Phylogeny	18	19	37
b OD Natural Environment	1	1	2
c OD Earth and History of Life	27	17	44
d Scientific Service Heritage	6	0	6
Total 2015	**52**	**37**	**89**



LIBRARY

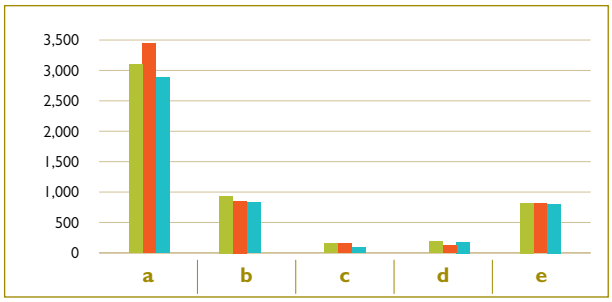
The library continues its back-cataloguing work. The growth in number of titles in the catalogue remains steady despite a drop in new acquisitions. We see progress in the consultations of online journals, showing evolution in use of the library's resources.

ACQUISITIONS

	2013	2014	**2015**
Books and journals	+8,145	+8,665	+7,097
Electronic journals	+137	+204	+152
Back-cataloguing	0	+5,448	+7,148

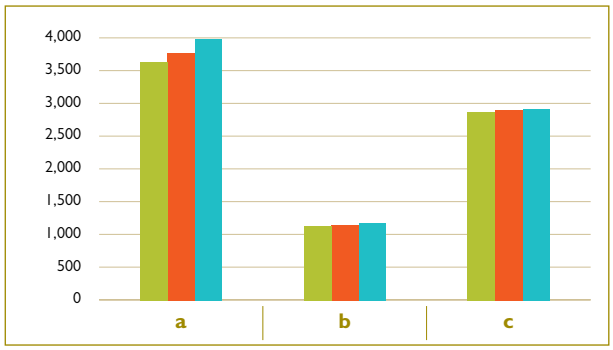
LOANS

	2013	2014	**2015**
a Internal loan of documents	3,071	3,419	2,869
b On-site consultation by external visitors	931	850	832
Inter-library loans			
c *Sent documents*	154	161	90
d *Received documents*	198	138	192
e International exchanges	828	815	809



TYPES OF CONSULTED ELECTRONIC DOCUMENTS

	2013	2014	**2015**
a Periodicals	3,623	3,748	3,972
b Abstracts	1,123	1,152	1,189
c Complete text	2,851	2,891	2,916
Total consultation sessions	**8,455**	**8,681**	**8,747**



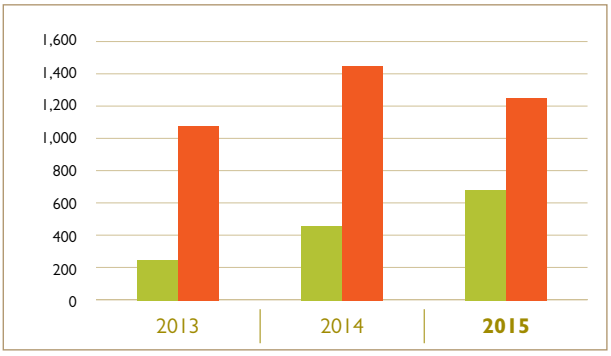
COLLECTIONS

SCIENTIFIC VALORIZATION

The number of scientific visitors to our collections grew by 50% in a year, after an increase of 85% between 2013 and 2014. Visitors for entomology almost tripled in number in a year, with 70% of the total visits. Visits are more frequent but shorter.

Additions to the collections continue, but the decrease is constant: 30% less than in 2014. With almost 63,000 acquisitions, we are still nowhere near the figures for 2012 (190,000 acquisitions). This is a direct consequence of the reduction of our endowment since 2013, which has had an impact on our capacity to acquire collection items.

	Number of visiting scientists / Number of days	Additions to the collections	Number of loans
Vertebrates	16/62	156	11
Invertebrates	34/80	10,000	22
Entomology	476/764	47,292	196
Palaeontology	39/145	462	9
Anthropology and Prehistory	27/111	0	7
Geology	85/85	4,944	87
Total	**679 /1,247**	**62,854**	**332**



DIGITISATION OF THE COLLECTIONS

The number of specimen registrations tripled compared to 2014.
This sharp rise is mainly due to digitization of geology collections.

ENCODING IN THE DaRWIN DATABASE				
	Recording of types	New species	Recording of non-types	Total items recorded in DaRWIN
Growth 2013	939	14,801	1,939	15,740
Growth 2014	523	15,668	2,537	16,191
Growth 2015	708	45,676	1,453	43,491
Total	**2,170**	**76,145**	**5,929**	**75,422**

BREAKDOWN OF ENCODING TASKS (%)	
Addition of data	81.94%
Updating of data	18.06%

ENCODING PER DEPARTMENT	2013	2014	2015
Vertebrates	12,954	6,384	6,704
Invertebrates	10,587	12,384	6,403
Entomology	4,067	1,795	559
Palaeontology	4	7	20
Geology	7	373	31,990
Total	**27,619**	**20,943**	**45,676**

MUSEUM

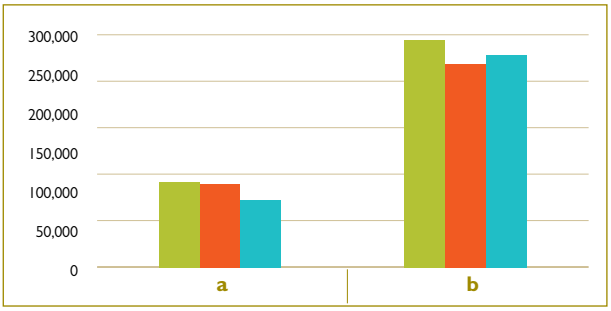
In 2015, the Institute welcomed 300,011 visitors, a drop of 2.5% compared with 2014. Of these visitors, 43,953 visited the temporary exhibition *Brain Twisters* over 8 months, and 35,777 visited **WoW** over 2.5 months. After the failure in visitor numbers for *Brain Twisters, WoW* is off to a flying start with an average of 14,000 visitors per month. Without the specific security situation we experienced at the end of 2015, the figures would have been significantly more positive.

In 2015, the two travelling exhibitions co-produced by the Institute (*Senses* and *Baby Animals*) and which were on display in other museums, drew more than 450,000 Visitors. The XperiLAB truck was a roaring success as usual, with 11,055 participants.

For the BNEC, 2015 was a year of homelessness, but also a year of development and production of a new exhibition (*Classific'Action* which opened in early 2016). Over 4,500 young people from Brussels visited the *Veilleurs de nuit* and *Water l'eau* exhibitions.

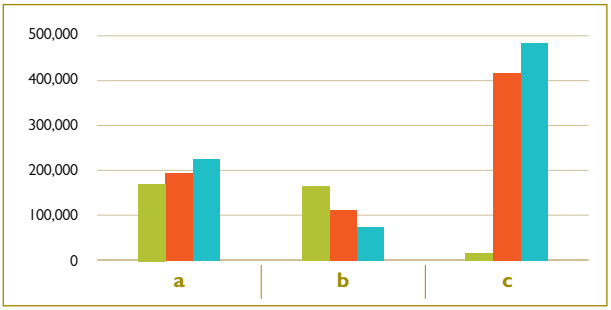
MUSEUM ATTENDANCE

	2013	2014	**2015**
a Visitors in groups	90,924	88,846	72,529
b Individuals and families	243,266	216,932	227,482
Total	**334,190**	**305,778**	**300,011**



BREAKDOWN OF MUSEUM ATTENDANCE

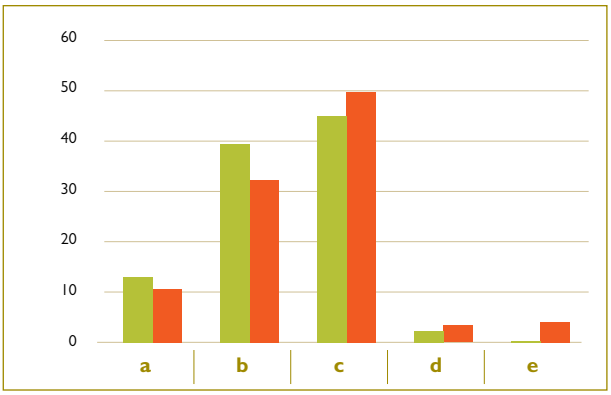
	2013	2014	**2015**
a Permanent galleries	170,270	193,602	225,853
b Temporary exhibitions (on-site)	163,920	112,178	74,158
Total Museum	**334,190**	**305,780**	**300,011**
c Temporary exhibitions (off-site)	16,617	414,816	482,272



BREAKDOWN OF VISITORS BY AGE GROUP (%)

For the third year running, the breakdown of visitors by age group is different from the usual breakdown. Adults make up the largest proportion of visitors (44% in 2014, 46% in 2015) while traditionally first place always went to 6-17 year olds. This seems to be a real trend. The Museum is no longer perceived as a place for children, but increasingly for a wider audience.

		Permanent	Temporary	**Total**
a	Small children (0-5 years)	13.02	10.56	12.41
b	Young people (6-17 years)	39.42	32.22	37.64
c	Adults (18-59 ans)	45.04	49.81	46.22
d	Senior citizens (60+)	2.24	3.32	2.51
e	Not known	0.28	4.09	1.22



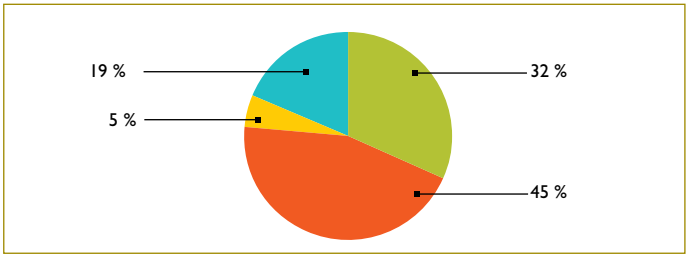
REDUCED AND FREE ADMISSION

The number of free entries remains stable from one year to the next, at around 25%. The main group of free entries are children under 6 years old. 5% of visitors make use of free entries on the first Wednesday of each month.

In the end, only 32% of visitors paid full price, which is nonetheless an increase from 28% in 2014.

Reduced rate makes up most of the tickets, since it includes group visits and all reasons for reduction (senior citizens, students etc) and all initiatives taken by the Institute, alone or with partners (SNCB, Brussels card etc) to attract as many visitors as possible to the Museum.

	Number
Full admission	95,430
Reduced admission	133,974
Free admission on 1st Weds of month	14,869
Other free admission	55,738
Total	**300,011**



SHOP CUSTOMERS

Visits to the shop are stable. The number of visitors who make purchases in the shop remains low at 7.73%. The shop clearly suffers from its unfavorable location in the middle of the Museum.

The average spend per customer is on the rise (€15.33 compared to 2014's €14.86).

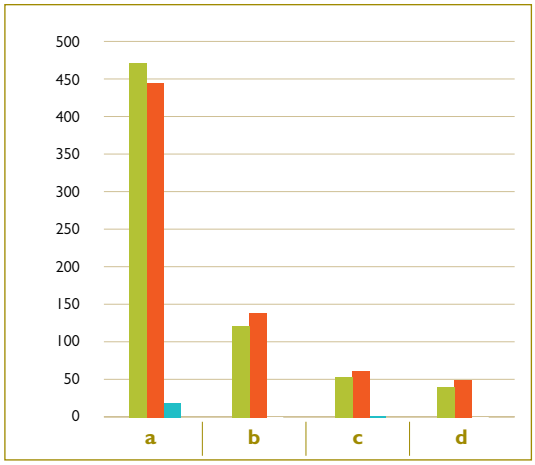
	2013	2014	**2015**
Museum visitors	334,190	305,780	300,011
Shop customers	25,689	23,889	23,176
Rapport customer/visitor	7.69%	7.81%	7.73%
Expenditure/customer	14,76	14,86	15,33
Expenditure/visitor	1,13	1,16	1,18

THE MUSEUM IN THE MEDIA

The visibility of the Institute in the printed press is 10% up on 2014. Combining all media formats, there are over a thousand references to our activities across the year. We see a particular improvement in the Dutch-speaking press, up 16%. Outside national media, there is a small flurry, from 13 to 23 mentions, but which remains relatively limited.

We are mentioned almost three times a day on average by traditional media.

	FR	NL	Others
Printed press			
Articles Museum	228	194	
Articles Institute	205	196	
Articles on temporary exhibitions	37	53	
a Total printed press	**470**	**443**	**20**
b *of which interviews RBINS employees*	*121*	*139*	
Radio and TV			
c Total Radio and TV	**54**	**61**	**3**
d *of which interviews RBINS employees*	*41*	*50*	
Total general	**524**	**504**	**23**



ACTIVITIES ORGANIZED BY THE EDUCATIONAL SERVICE

The number of participants in the Educational Service's activities amounted to more than 57,000 people, indoor and outdoor. Compared with 2014, there was a drop of 6%, a trend which can be attributed to *Brain Twisters* exhibition's lack of success with schools.

On average, 21 people participate in the activities. This is a maximum given that we wish to preserve the transmission quality of the educational message.

	2013	2014	**2015**
Number of participants	62,594	60,060	56,556
of which groups (indoor + outdoor)	*56,163*	*53,529*	*49,473*
of which individuals	*6,431*	*6,531*	*7,083*
Number of organised activities	3,083	2 ,831	2 ,636
Average number of participants per activity	20.3	21.2	21.4

PROPORTION OF VISITORS IN ACCOMPANIED VISITS ON-SITE (%)

The percentage of accompanied visits amounts to 49.7%. This is an increase on 2014's 46%. Half of school groups requests accompaniment from our Educational Service, which shows the relationship of trust between the Museum and schools. Compared to visitors overall, this average rate of accompaniment remains stable at 14%.

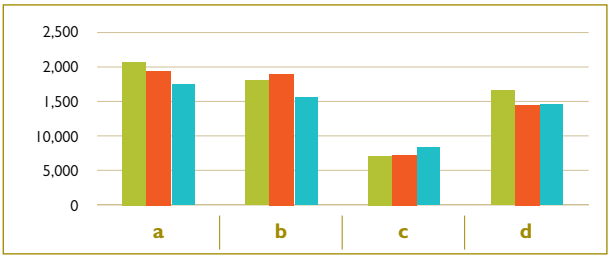
	2013	2014	**2015**
In relation to the total number of museum visitors	13.8	14.9	14.0
In relation to group visitors	50.6	46.0	49.7

BREAKDOWN OF VISITORS PER ACTIVITY

Guided visits continue to be a vital aspect of our educational programme and the success of workshops continues despite a downturn compared to 2013 and 2014 which were record years.

We see stability in the number of participants in our outdoor Activities. These are largely exhibition workshops of the BNEC and visits to our science truck XperiLAB.

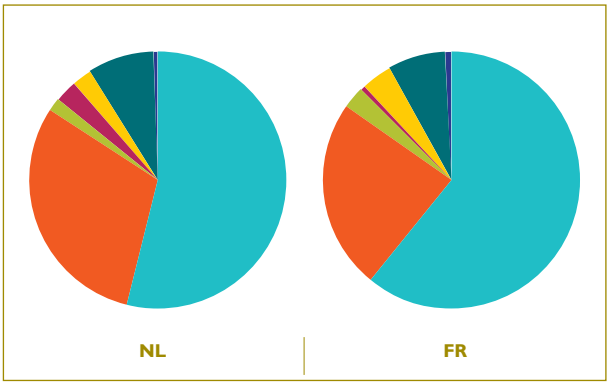
	2013	2014	**2015**
a Guided tours	20,718	19,332	17,604
b Workshops	18,043	18,933	15,692
c Other activities	7,216	7,364	8,599
d Off-site activities	16,617	14,431	14,661
Total	**62,594**	**60,060**	**56,556**



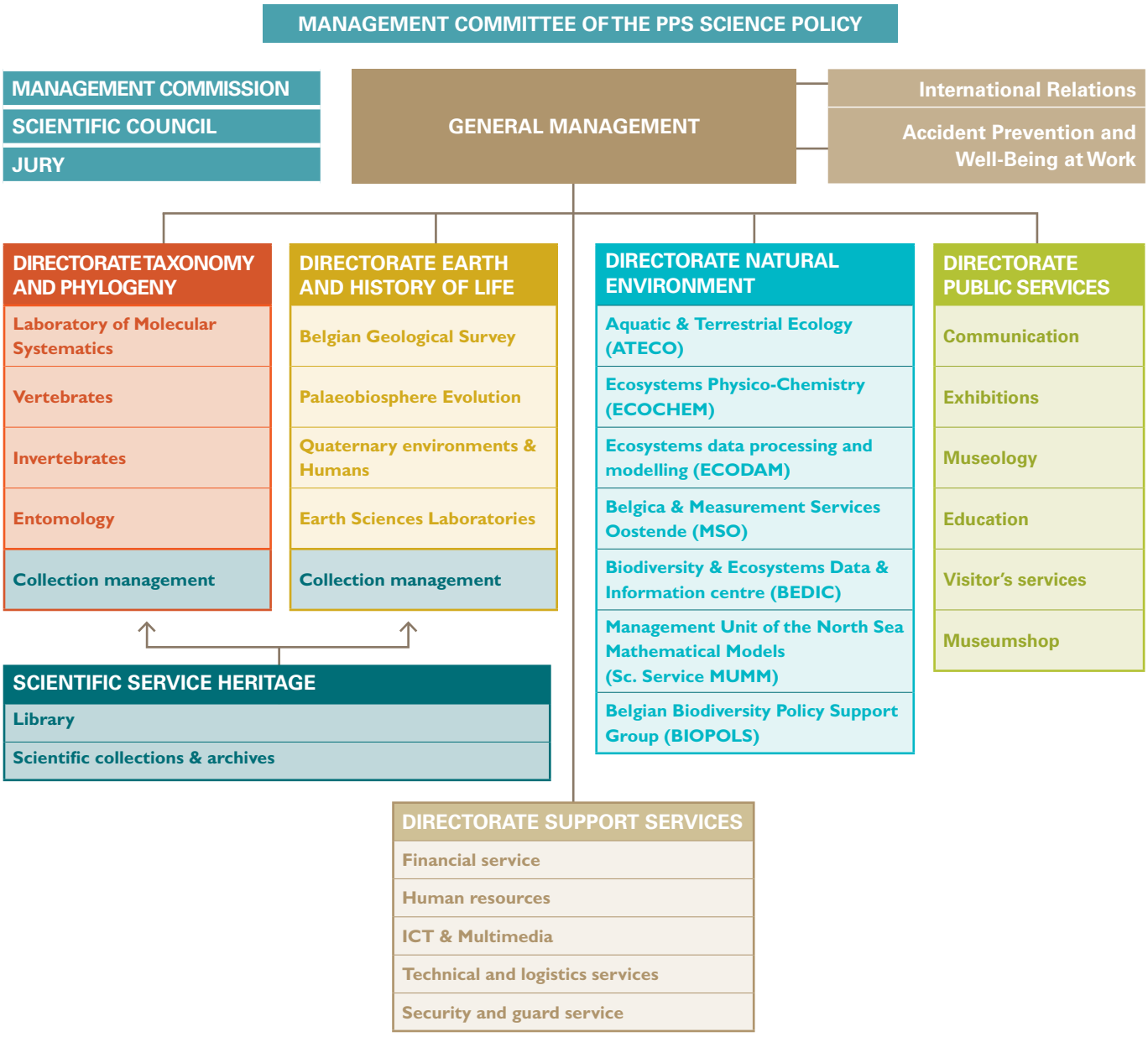
PROFILE OF PARTICIPANTS IN GUIDED TOURS AND IN WORKSHOPS (%)

The audience of the Educational Service is mainly made up of nursery schools and primary schools. We see a difference between French-speaking and Dutch-speaking audiences, with more Dutch-speaking secondary schools. However, we are happy to report that the lack of French-speaking secondary schools has abated: figures moved from 15% in 2014 to 24% in 2015. They do not match the 30% we see on the Dutch-speaking side,

	NL	FR
Nursery & primary school	54.04	61.07
Secondary school	30.31	23.88
Higher education	1.54	2.61
General education	2.99	0.76
Youth groups	2.38	3.84
Groups of adults	8.2	7.19
Individuals and families	0.54	0.65
Total	**100**	**100**



ORGANIZATION



The Royal Belgian Institute of Natural Sciences is one of the ten federal scientific establishments that are governed by the Belgian Science Policy Office (Belspo).

The RBINS is a State service.
It is separately managed by **three independent entities:**

- **The Scientific Council o**ffers advice on issues of a scientific nature that have an impact on the accomplishment of the tasks of the Institute.
- **The Management Commission** is responsible for the financial and practical management of the RBINS. It is the same body for the RBINS and the Royal Museum for Central Africa.
- **The Management Board** is responsible for the day-to-day Institute's management.

Moreover the Jury for recruitment and promotion is responsible for recruiting the permanent scientific employees and monitoring their carreers.

In addition, the Institute's General Director is also a full member of the Management Committee of the Belgian Science Policy Office.

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All of RBINS activities are described in the 2015 detailed report (FR/NL).
This report is available on CD ROM and can be obtained
on request from direction@naturalsciences.be.

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museum