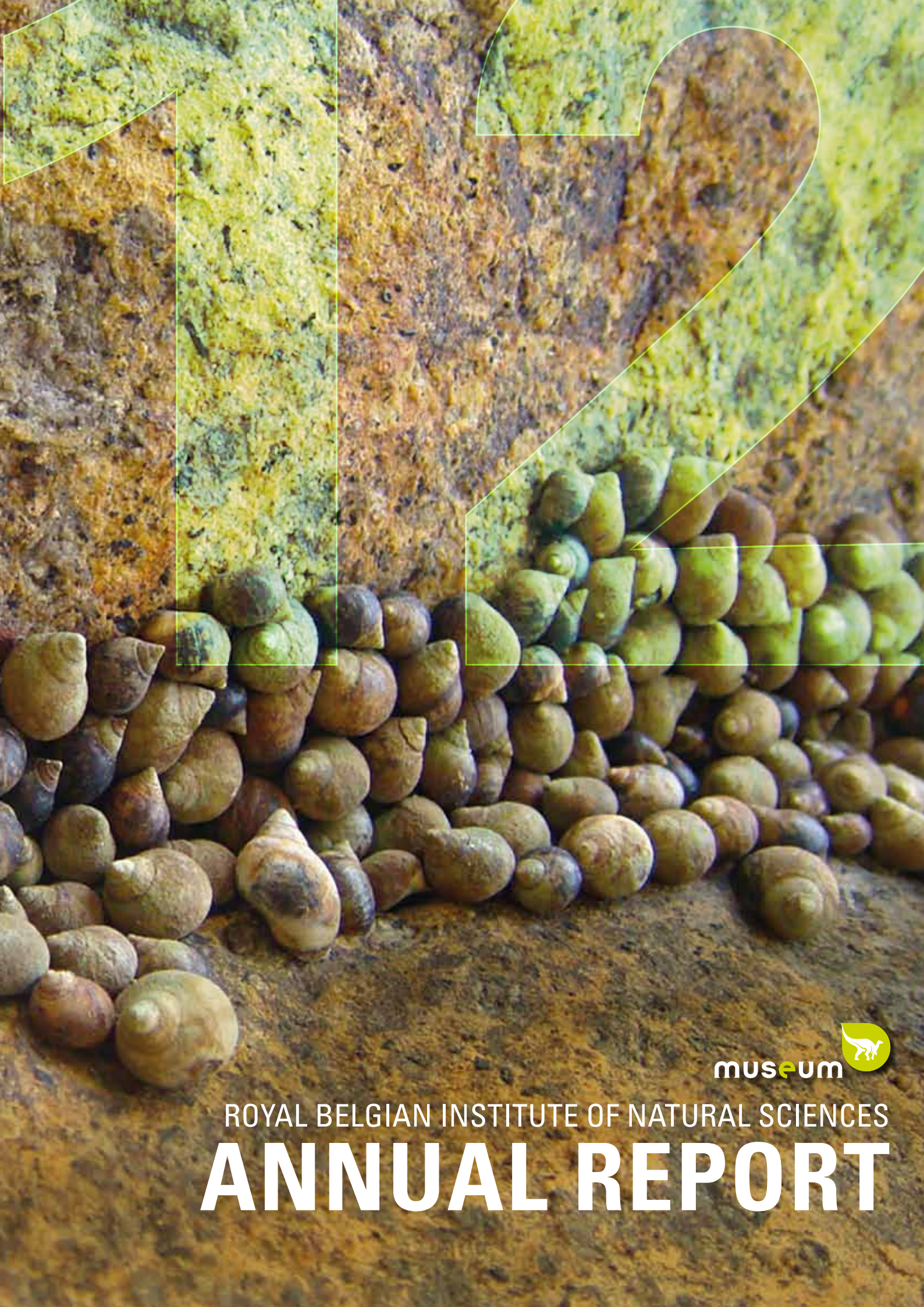

museum

ROYAL BELGIAN INSTITUTE OF NATURAL SCIENCES

ANNUAL REPORT

During the course of 2012, the RBINS tragically lost two of its loyal staff members, Maud Ibanez and Jean-Sébastien Houziaux.

We pay tribute to their memory.

FOREWORD

On 5 January 2012, one of the first visitors to the Museum was the Man of Spy, our Belgian *Homo sapiens neanderthalensis*. His hyper-realistic reconstruction passed through Brussels before returning to his site of origin, giving a spectacular kick-start to a record year: on 31 December, more than 323,000 real visitors had visited the Museum in 2012. After two lacklustre years, the Museum was back on the road to success, tangibly demonstrating its good reputation on the Internet and on social networks.

Hidden behind the Man of Spy's two hours of media glory lay a scientific undertaking involving years of work to examine the fossils, study their biomechanics, create 3D models of them and document all the issues involved in a reconstruction. As the selection presented this year amply demonstrates, many scientific research findings are the result of decades of work. Reporting on the effectiveness of regulations to prevent sea pollution was based on 20 years of aerial observation data. Demonstrating the specific qualities of a geological area and supporting its UNESCO status was based on 20 years of research and collaboration. Setting out to inventory the biodiversity of the canopy in Panama, and using it as the basis for a study that made the front cover of the leading scientific journal Science, took nine years of research.

The benefit of science often only becomes evident over a long period of time. As with 'slow food', we need 'slow science'. Every year makes its contribution, but the real results are developed over decades. How can we conduct environmental impact studies without looking back over time to correctly interpret the data? How can we present collections to the general public without the knowledge that goes with them?

Scientific output has its own time frame which is sometimes at odds with the requirements for speed and visibility that underlie project funding methods. It is nevertheless fundamental to all the services that an institute like ours can – and must – offer society.

Camille Pisani,
General Director

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RESEARCH

Marine Ecosystem Management > **Grey Seal bites Porpoise**

The MUMM department is the first organisation to describe a case of Grey Seal predation on another mammal. In the process, it has explained for the first time the mutilated porpoise bodies that have washed up on the southern shores of the North Sea over a number of years.

This remarkable conclusion was drawn after the MUMM's examination of two porpoises, which had beached at Knokke-Heist and Ostend in September 2011. There is nothing extraordinary about finding a dead porpoise on a Belgian beach.
But the two cases in question were quite exceptional.

To start with, it was not the sort of weather that we would normally associate with these events and, on top of that, there were significant wounds on the animals, which, given the time of day, could not have been the work of seagulls, foxes or other scavengers. The autopsy confirmed that the wounds were fresh and untouched. The bodies were examined in great detail, with help from experts from the University of Liège. In addition, a comparison was made of tooth alignments in more than 140 seal skulls held by the RBINS and other scientific establishments in our neighbouring countries. It seemed clear that the wounds were consistent with the bite patterns of large - and so presumably male - Grey Seals. The contusions around the wounds, and the fact that much of the tissue had been removed, suggested that what we were seeing was, in fact, predation.

The MUMM reported its study at a symposium in Amsterdam in October 2012 and in the Aquatic Mammals Journal.

Biodiversity Focal Point > **Congo Plant Lexicon**

Manpower and knowledge are needed to observe and conserve the biodiversity of the great continent of Africa. But people without scientific expertise can also help describe and inventory habitats. And this calls for the right tools for the job.

The RBINS has taken initiatives, in association with educational institutions and nature organisations in the field, mostly in DR Congo and Burundi- but soon also in Benin - to develop a sort of general expertise in biodiversity. This is done by educating the custodians of the reserves, organising workshops to create study resources - such as manuals - and establishing a standard by which to inventory and document changes in the local environment. There is also a need to publicise the results widely. In the case of the Bombo-Lumene Reserve and hunting grounds near Kinshasa, for example, the Plant Lexicon was written in the Kiteke language, and contains the common names (in Kiteke) and photos of 149 plant species. In 2012, a start was made on a second lexicon for the more mountainous Kahuzi-Biega National Park. This contains common names in four of the languages spoken in the area around the park. Not only do the common names make it possible for data to be collected by non-scientists, but they often say something about how the species is used and its relationship with the ecosystem.
The RBINS is also helping PhD students make specific recommendations on the strength of the data collected, in order to improve the management of the parks and ensure that action is taken in the conservation areas.

2012 saw the end of the first five-year term in which the National Focal Point for Biodiversity was involved in the project under the programme run by the Directorate-General for Development Cooperation (DGOS).

>
05.01

The laboratories of the RBINS and of Brussels university, ULB, provided the scientific basis for a masterful reconstruction of the "Man of Spy".

Vertebrates > New Species of Reptile Found in Madagascar

The international trade in snakes, chameleons, tortoises, geckos and other reptiles is often subject to commercial quotas and strict controls. The work of the regulatory authorities would be easier if standard genetic information on these animals were readily available.

RBINS researchers have made an important contribution in this area by setting up a database of information from the largest DNA barcoding study ever undertaken into reptiles. The researchers worked as part of an international partnership, which compared data on almost 260 reptile species from the island of Madagascar, home to about four hundred known species. A detailed examination of DNA from tissue samples collected over the past twenty years brought the researchers to the conclusion that there are more species to be discovered, even on this much-studied island.

The DNA barcoding led to the discovery of about forty new species of reptile. Furthermore, differentiation was noted among species that show no morphological differences and at times occur in sites measuring just a few square kilometres. The new information database also contains codes for 110 of the 140 Madagascan reptile species on the CITES list (Convention on the International Trade in Endangered Species of Wild Fauna and Flora, better known as the Washington Convention). The RBINS researchers worked in the Brussels JEMU team (Joint Experimental Molecular Unit), alongside researchers from the Royal Museum for Central Africa (RMCA) as well as the *Technische Universität Braunschweig* and *Zoologische Staatssammlung* München. Their research results were published in the PLoS ONE journal.

Invertebrates > Research into Periwinkles in the Azores

It can be difficult to decide how to mark out reserves and conservation areas with a view to preserving their biodiversity, because our understanding of diversity is constantly evolving. DNA research by the RBINS, following fieldwork in the Azores archipelago, shows that the marine periwinkle, Melaraphe neritoides, exhibits an extremely high genetic variation and that among the populations in the study, genetic differentiation is unusually high. This is of particular interest, because it has always been assumed that these little creatures are uniformly genetically grouped across their dispersal area. Indeed, earlier research had suggested that there was no genetic differentiation between populations thousands of kilometres apart.

Periwinkles are marine snails that have long-lived, planktonic larvae, believed capable of dispersing over very large distances on sea currents. However, doctoral research undertaken at the RBINS shows that this traditional view is in need of review, because, although geographically very close, periwinkle populations in the Azores are very highly genetically differentiated. This could mean that the marine environment is much less homogenous than has been assumed to date, even in species that are widely dispersed. This intensive, fundamental research into micro and macro evolution in the periwinkle populations of the Azores, which offers a new insight on the demarcation of reserves and protected areas, is actually a PhD study undertaken as part of a BELSPO Action 1 project.

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08.02

A male sperm whale weighing some 20 tonnes and measuring 13.5 metres long washed ashore on Heist beach. The MUMM coordinated the autopsy on the apparently healthy animal.

Invertebrates > **European School of Taxonomy takes New Direction**

On the basis of its activities in 2012, the "Distributed European School of Taxonomy (DEST)" has set itself two key objectives: to continue to internationalise and, at the same time, involve young scientists from economically poorer regions in the taxonomy courses. At the heart of this plan lies the search for funding and collaborations with universities and other partners outside the EU.

For several years now, the RBINS has taken the lead in training young taxonomists from around the world. The reason being that the subject of taxonomy is not as common as it once was in the universities. It was this observation that gave rise to the "Distributed European School of Taxonomy (DEST)", which has received funding from the European Commission since 2008 and was set up, under the auspices of the Consortium of European Taxonomic Facilities (CETAF), to prepare a new crop of taxonomists to take over from a generation now close to retirement. Since its foundation, DEST has gained a worldwide reputation. In the 2011-2012 academic year, one hundred master's students, post-doctoral students and early-career researchers, selected from 180 candidates, took part in sixteen courses taught by lecturers from an international pool of about one hundred. Despite being selected, however, some of the students, mostly from Africa, Asia and Latin America, were unable to take part in the lessons.

With support from DEST's administrator, the RBINS, the school is able to award a number of travel grants to its participants, but the system's outreach is in need of improvement. In early 2012, DEST received funding from the Royal Swedish Academy of Science and the World Association of Copepodologists, but the search for funding continues. Thanks to this joint effort, the school was able to award grants to three students in 2012, from Brazil, Lebanon and Ukraine. Thirty-two grants, for the 2012-2013 programme as a whole, and for a total value of €15,000, are earmarked for students from around the world.

Marine Ecosystem Management > **RV Belgica tests Satellite Navigation System**

EGNOS was originally designed for air and land applications. It is hoped that this study will help get the marine application up and running. Three onboard devices will receive data from the EGNOS satellites and the first of the Galileo satellites. It is important for the data to be compared in different circumstances: out at sea and close to port, when the vessel is moving and when it is stationary, and in different weather conditions.

The MUMM has accepted a request from the European Space Agency (ESA) to test EGNOS (the European Geostationary Navigation Overlay Service) at sea, aboard the research vessel, Belgica. EGNOS is the forerunner to the general European satellite navigation system, Galileo, which is currently under construction (the counterpart of the American GPS).

The presence of these devices aboard the RV Belgica will in no way impede the vessel's other activities. The project commenced in August 2012 and is set to continue in 2013. This is the first time that data from EGNOS has been collected over such an extended period.

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17.02

As part of the European project PLACES, the RBINS hosted the colloquium "*Agir collectivement pour penser la ville*" (Acting together to design the city), initiated by the Sustainable neighbourhoods network.

>
03.03

Museum Night Fever 2012 was a great success for the Museum with a relaxed public turning out in their numbers to enjoy our galleries in an alternative way.

Invertebrates > Exotic Blue Flatworm on the Rise

Invasive exotic plant and animal species can cause serious problems for the environment, and even public health. The subject of invasive exotic plant and animal species is therefore topical and features in many conventions, government initiatives, monitoring schemes and preventive programmes. The RBINS actively participates in these activities.

Researchers from the Invertebrates department, for example, published a DNA study on several remarkable garden flatworms from an orchard on the Spanish island of Menorca (Balearic Islands), which had been sent to the department for identification. The DNA sequencing analysis carried out by the RBINS lab showed that the specimens were of the blue garden flatworm, *Caenoplana coerulea,* which is indigenous to Australia.

Given that earlier invasions by exotic garden flatworms have presented a serious threat to indigenous fauna, particularly through earthworm and snail predation, we will need to keep close tabs on whether this species establishes itself in Europe and eventually emerges as an invasive species. Recently, a similar garden flatworm, *Platydemus manokwari*, has been spreading rapidly through the Pacific islands, where it is endangering local, indigenous land snail fauna. It has even been said that this flatworm is among the world's one hundred most harmful invasive species. This will not, in all likelihood, be the case for *Caenoplana coerulea*, but it has been spotted in England, France and northern Spain. Vigilance is key.

Invertebrates > A closer Look at Land Snails in Sri Lanka, India and Southeast Asia

Southeast Asia and the Indian subcontinent together form an area of very high biodiversity, which is home to an extraordinary number of as yet undescribed species. But there is little time to waste, because that biodiversity is under increasing strain as the result of human pressure on the environment.

In recent years, the RBINS has developed a research programme on the taxonomy and phylogeography of land snails and other terrestrial invertebrates. On 1 May 2012, the Invertebrates department began to DNA sequence a number of land snails indigenous to Sri Lanka. The initial results of this study show that the highland and lowland forests of Sri Lanka were not colonised at once, but in a number of separate stages. The taxonomy of land snails in Sri Lanka, India and Nepal is in need of radical review. At the present time the RBINS is working on a large, illustrated monograph on land snails in the Western Ghats in India, covering more than three hundred species. This is the first global review of this rich fauna since the very early twentieth century.

The role now played by the RBINS in this region came about through collaboration with the Natural History Museum in London. The network has since grown to include the University of Antwerp, the University of Nottingham (UK), Chulalongkorn University, Bangkok (Thailand) and Tribhuvan University, Kathmandu (Nepal). The research is now up and running thanks to support from BELSPO and the arrival of postdoctoral researchers from the region.

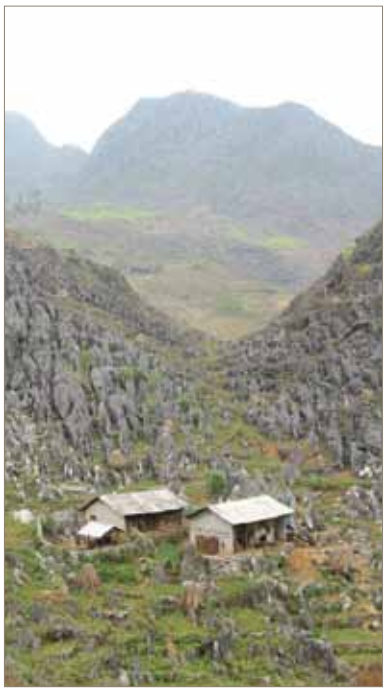
> 15.03

The touring exhibition "X-Treme" received its millionth visitor while at the Museum of Natural History Vienna (Austria).

> 22.03

The RBINS and the Belgium-Luxembourg Union of Geologists held a major scientific symposium, coupled with field trips, on the sustainable management of natural resources.

Belgian Geological Service > **Geopark in Vietnam**



Some areas are highly remarkable, even unique, because of their geological structure, and this can give rise to unique cultural behaviours among the local population. By focusing attention on these areas' potential for tourism, we may be able to protect them from the types of traditional economic activity and exploitation that strip them of their unique character. A UNESCO programme, set up to create Geoparks around the world, aims to help such areas retain their uniqueness.

The first Geopark was created in Vietnam in 2012, thanks in part to the RBINS. The Dong Van Karst Plateau Geopark in north-east Vietnam is known for its desolate, formerly inaccessible landscape, which is home to one of the largest concentrations of ethnic minorities to have preserved its own farming traditions and practices.

The RBINS went to the area for the first time in 1991, when it travelled with an economic mission to Vietnam from the West. The mission focused on the trade in raw materials but, thanks to its links with several institutions, the RBINS was given the opportunity to explore the country's mountainous region. In the end, it was water management and a series of nature conservation projects that produced the development model for this valuable area, which satisfies the UNESCO programme criteria.

The RBINS has always played a significant role in the educational work needed to secure the area's recognition as a UNESCO Global Geopark, in the framework of a project supported by the Flemish Interuniversity Council (VLIR). In 2012, this twenty-year partnership drew to an end.

Belgian Geological Service > **Sustainable Use of Natural Minerals**

Mining and ore extraction are important economic activities in the Democratic Republic of Congo. These activities can be industrial in scale, or smaller and less formal. In either case, it is essential that a sustainable methodology isfound to relieve the human pressure on the environment.

Along with the Royal Museum for Central Africa (RMCA), the RBINS played an important role in the scientific aspect of Belgian relations with DR Congo, placing the focus on sustainability. Between 2010 and 2012, several missions departed for the area around Katanga, where they planned to study its mineralogy and cartography and the impact of mining on the environment. Where mineralogy is concerned, much of the attention turned to the cobalt ore, heterogenite. The RBINS's scientists found a new and more accurate chemical formula for the ore, and this better understanding of the black powder is set to improve cobalt extraction processes and make them more environmentally friendly. It has been shown that the substances used to extract the cobalt from the ore need not be as reactive.

It was also possible to improve the environmental effects of mining through an in-depth evaluation of the local situation and a number of awareness-raising projects. For example, attention has focused on construction materials and their usage. Some of the mining in Congo is informal and, in these cases, operations can sometimes take a huge toll on the environment. Furthermore, it is possible to prepare construction materials, such as cement, on site, instead of transporting it over long distances.

This GECO team project (Geology for an ECOnomically sustainable development) in the east and southeast of Congo, which came to an end in 2012, brought a great deal of Belgian expertise on the sustainable management of natural mineral resources to the region.

>
24.03

The annual workshop on bats was organised by Plecotus (Natagora) and Vleermuizenwerkgroep (Natuurpunt) in collaboration with the Conservation Biology Section.

>
27.03

Our cash desks and reservations system were equipped with a new software application, GTS-V5, from a French company. Performance and easy maintenance are key features.

Conservation Biology > **Nature Reserve in the Sahara at Last**

The vast region of the Sahel and Sahara is extremely vulnerable and there is a real need to conserve its biological diversity. The indigenous large fauna includes several emblematic but nonetheless endangered species, such as the Mendes antelope (*Addax nasomaculatus*), the Dama gazelle (*Nanger dama*), the Dorcas gazelle (*Gazella dorcas*), the Saharan cheetah (*Acinonyx jubatus hecki*) and a great many other mammals, reptiles and birds. Hunting, along with encroaching agriculture and industry, pose a direct threat to these species, or seriously limit their original habitat. The local herdsmen are also endangered by this evolution in their livelihoods. From this perspective, the foundation of the Termit and Tin Toumma National Nature and Culture Reserve, approved by the government of the West African Republic of Niger on 6 March, is an extremely important step towards conserving the biodiversity of the Sahara and Sahel.

The reserve is situated in the east of Niger and covers an area of 97,000 km^2, making it the biggest reserve on the African continent. This success has been possible despite the presence of the oil industry (a partner in the consultations) and the threat of terrorism, which at times involved the armed forces to ensure the protection of the researchers and conservationists.

The RBINS played a significant role in the breakthrough, because it has maintained a presence on the ground for years in preparation for a successful outcome. Twelve years ago, the RBINS was one of the initiators of the migrating animal species conservation programme set out in the Convention on Migratory Species (CMS, or Bonn Convention). The RBINS also works closely with the *Sahara Conservation Fund*, a non-governmental organisation.

Belgian Geological Service > **Clean Coal in Kazakhstan**

Kazakhstan draws on its huge coal reserves to fuel its economic development. However, that coal is mostly of poor quality and its power stations are outmoded. Furthermore, given the local perception that sustainable mining is expensive and yields nothing in return, the country's industry is not exactly straining to improve the situation. Yet, by employing a few methods and models it is technically and economically feasible to improve the quality of coalmining operations and so reduce their impact on the environment. In association with several other partners, the RBINS is sharing with Kazakhstan the knowledge gained in this area. This is because researchers from the RBINS Geology department have considerable expertise in the subject.

Kazakhstan has yet to take the initial steps towards storage, in sealed geological reservoirs, of the CO_2 released through the burning of coal in its power stations and other industrial installations. But, in the space of three years, the technique has become more familiar and is now open to discussion. A number of workshops and site visits have been organised and there have been three practical case studies of CO_2 storage, improved air quality and coal beneficiation. In the power stations themselves, they are now looking at whether emissions of fine dust and other pollutants can be kept under control. The RBINS has shared its expertise with local industry and the local geological institutions, such as the University of Nazerbajev in Astana. The EU-funded "Assistance in Clean Coal and Environmentally Sound Storage" or "ACCESS" project, of which this mission was part, has also produced a paper for the government and power-generation sector.

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05.05

The Kunstenfestivaldesarts stopped at the Museum. A museologist gave her perspective during an interdisciplinary exchange of views on the SnakeSkins performance.

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22.05

A shrimp and a European flat oyster were our marine biodiversity representatives for World Biodiversity Day.

Marine Ecosystem Management > **Chemical Pollution of Europe's Seas**

The detection and remediation of chemical pollution in Europe's seas is an extremely important task, but one that still resides with too many authorities that follow different guidelines and hence do not cooperate as they should . A group of European experts, one of whom is an RBINS researcher, has investigated the level of pollution in Europe's seas and looked at how the problem might be tackled locally. The study makes it clear that Europe's seas are benefiting from the measures previously put in place to reduce historical PCB and heavy metal contamination. But research is still needed, especially on the effects of latent pollution sources, low concentrations and mixed toxicity. In some situations levels have not reached the threshold values for zero risk. Equally important is the group of experts' conclusion that significant differences, in terms of observations and measurements, still exist between the EU Member States. The situation in the Black Sea, for example, is clearly worse than that in the Baltic, the Atlantic and the Mediterranean. This is due to a lack of sustained political will, despite the good intentions.

The European "Marine Strategy Framework Directive" is pressing for a uniform policy and better cooperation between the initiatives of the countries of the North East Atlantic OSPAR Convention, and the bodies that safeguard the quality of the seawater in the other regions of Europe. Dialogue and cooperation between the authorities has improved, although not yet to a sufficient extent.

On European Maritime Day in Gothenburg, Sweden, the group of experts brought together on the initiative of the European Science Foundation's European Marine Board, presented its conclusions in a position paper entitled "Chemical Pollution in Europe's Seas: Programmes, Practices and Priorities for Research".

Anthropology & Prehistory > **Reconstruction of a Neanderthal**

Using Neanderthal bones from the RBINS's collection, an international multidisciplinary team worked with colleagues from the RBINS to construct a model of what the "Man of Spy" might have looked like.

The "Man of Spy" came to light following discoveries made in a cave in the village of Spy, in Namur province, by Liège-based anthropologists Maximin Lohest and Marcel De Puydt in 1886. They found the remains of two adult Neanderthals, and the site later yielded thousands of fossilised human and animal bones and stone tools.

As part of a European project entitled "The Neanderthal Tools", a team of researchers examined the full collection of finds from Spy. The study confirmed that there were two Neanderthal adults, as well as a third individual, a Neanderthal child under the age of two, that lived in this area about 36,000 years ago.

Starch grains between the teeth reveal that their diet included vegetable matter, although it had previously been thought that Neanderthals were mainly carnivorous.

The RBINS and the ULB made a virtual, three-dimensional skeleton reconstruction based on an almost intact individual, Spy II, which was then printed three dimensionally by the Collective Centre for the Belgian Technology Industry (Sirris). Finally, Dutch artists Adrie and Alfons Kennis made a reconstruction of what the Neanderthal, nicknamed "Spyrou" after the residents of Spy, might have looked like.

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01.06

The Belgian Federal Public Service for Health, Food Chain Safety and the Environment had our institute produce its brochure "*La mer du Nord belge : une eau vive !*" (Belgium's North Sea: A Living Sea!).

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30.06

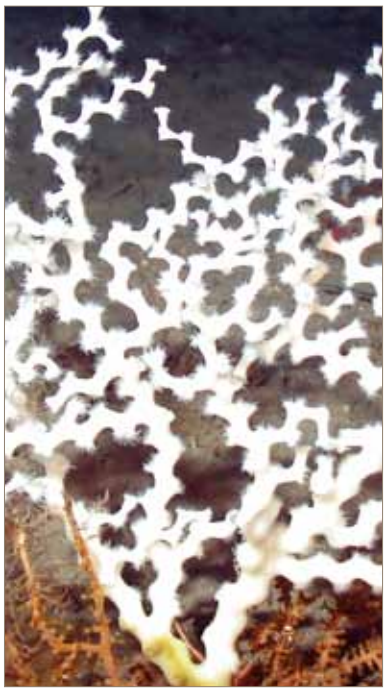
Our enticing truck laboratory XperiLAB.be finished the 2011-2012 school year with a total of 9,620 pupilvisitors: a record that will be hard to beat!

Marine Ecosystem Management > **Cold Water Coral Banks**

The study of cold water coral is still in its infancy, but scientists from the universities and institutes of Freiburg, Milan, Cork, Madrid and Granada, with support from the MUMM, set off in 2012 on an expedition aboard the oceanographic research vessel, the RV Belgica, bound for the Moira cold water coral mounds in the northeastern Atlantic ocean. These mounds lie about 100 kilometres southwest of Ireland, in an area named "Belgica Province" following the discovery of these deepwater coral banks by the University of Ghent's Renard Centre of Marine Geology during an expedition aboard the Belgica in 1997.

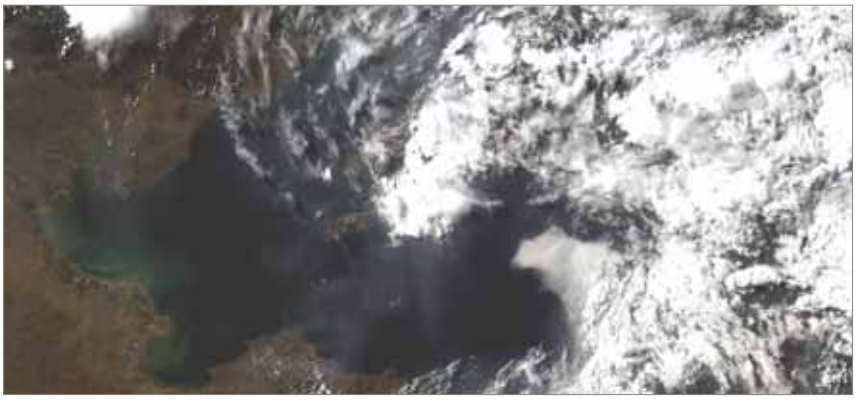
It was not until recently that the scientific community turned its attention to these cold water coral banks, which are very fragile and highly diverse. The scientific mission studied how the mounds form, how they interact with the surrounding ecosystem and their similarities and differences from similar structures in the Mediterranean.

The scientific helm of the Belgica was handed over to a team of foreign researchers between 2 and 7 June 2012. It is not uncommon for RV Belgica to be opened to research teams from Belgium and abroad. But, in the context of the Eurofleets FP7 project, the European Commission is offering financial support for initiatives that use the European fleet of research vessels in the most efficient way possible.
Exchanges are, therefore, encouraged. Portugal, for example, placed its oceanographic research vessel, the Don Carlos I, at the disposal of the Free University of Brussels in 2011. The Swiss-Italian-Irish-Spanish expedition aboard the RV Belgica, was greeted by the Belgian ambassador in Ireland on its departure from Cork and on its return to Galway.



Marine Ecosystem Management > **Geostationary Satellite Identifies Colour**

Satellites are used to measure seawater quality on the basis of colour. At the present time, however, the images come from polar orbiting satellites, which return just one photo of the North Sea a day. If the sky is cloudy, or another event occurs during that passage of the satellite, there will be a gap in the measurements. In 2009, the MUMM presented a study demonstrating that geostationary satellites, which are currently used for communication and meteorology, also have a potential marine application.



The MUMM now has a new set of results as part of its pioneering role in investigating the use of geostationary satellites in observations of the North Sea. In 2012, the MUMM took part in a workshop in South Korea, through which the Koreans, along with several international partners, analyzed data from their geostationary satellite to good effect, despite the technical problems involved.

Geostationary satellites are much further from the earth than ones orbiting the poles, implying a need for bigger, more expensive telescopes on extremely stable platforms. The results from the Korean satellite are encouraging, especially in the light of developing a similar, European satellite. The MUMM study is funded as part of the Geocolour project, under the federal STEREO programme.

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05.07

New visitors came to enjoy an aperitif among the dinosaurs, savouring the start of the summer holidays in a delightfully out-of-the-ordinary setting!

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14.07

Bronze medals went to two of the young Belgian candidates at the International Biology Olympiad (Singapore, 8-15 July). The RBINS supported the Belgian stage of this event.

Palaeontology > Evolution in Predation among Sperm Whales

Several years ago researchers from the RBINS began a phylogenetic and palaeocological study of how predation evolved among sperm whales in the Neogene (23 to 2.5 million years ago): i.e. the various ways in which they have fed over the course of evolution. The amalgamated results clearly reveal a great deal of diversity in predation through the course of sperm whale evolution.

Things were certainly more complex than they are for today's sperm whales, which mainly predate on squid using a special breathing technique. Contemporary sperm whales are therefore suction feeders, whereas there are undoubtedly species among the fossilised toothed whales that hunted with their teeth.

It is well known that the RBINS owns a significant collection of whale fossils from the North Sea basin, found in the mammal-rich Miocene and Pliocene strata in the area around Antwerp. The collection has been growing since the nineteenth century.

As well as consulting this collection, the research team - which consisted of experts from Lima, Pisa, Paris and Amsterdam - examined fossilised skeletons from Peru. In 2012, the RBINS study concentrated on the morphology and wear of the teeth of these marine mammals.

Palaeontology > Fossils from the Deurganckdok Lock

Ground excavations during the construction of the Deurganckdok Lock offered palaeontologists a unique opportunity to make new finds. This lock, which was designed to improve access to the Waasland port, is the biggest in the world. The extremely fossil-rich deposits in the 30-metre deep excavation tell in great detail the story of climate change and biodiversity over the past 35 million years.

The RBINS's palaeontologists have been following the excavations closely since November 2012. Along the way they have enlisted the help of numerous volunteers.

The study of climate change and biodiversity over the past 35 million years is long established at the RBINS. It involves fossil molluscs and fish, and fossilised whale bones. The RBINS owns one of the world's largest collections of whale fossils.

The study has received a boost in the past 10 years and new discoveries have been made regularly. In April 2012, for example, palaeontologists excavated another two whale skeletons in an area of land in Vrasene. They are hoping for all kinds of fascinating finds from the excavations at the Deurganckdok Lock. This work also opens the doors for further geological research.

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02.09

The "Senses" exhibition caused a storm, attracting a total of 125,156 visitors before closing its doors at the beginning of September.

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11.09

The 4th International Geologica Belgica Conference brought together leading geoscience experts around the theme of "Moving plates and melting icecaps".

COLLECTIONS

Invertebrates > **DNA Barcoding assists Forensics**

The presence and developmental stage of certain species of fly at a crime scene or at the location of a body are an indicator of the time of the crime or the victim's death. Knowledge of this subject can go a long way in assisting criminal lines of inquiry.

The Joint Experimental Molecular Unit (JEMU), which operates from the RBINS and the Royal Museum for Central Africa (RMCA), has set up a reference library of DNA barcodes in association with the National Institute of Criminalistics and Criminology, which can be consulted to identify the flies and their larvae found at a crime scene. This library results from the "Barcoding for two wings" project. The barcodes are based on an international standard and are used to link the larvae of the species under study to corresponding adult flies.

These are mostly flies of the type found in Belgium and Western Europe, but the library is of international importance. Researchers identified 182 DNA sequences for 58 species. The same species and populations sometimes contain varying genetic information).

The results were published in two leading international forensic journals, the International Journal of Legal Medicine and Forensic Science International. New sequences will be added in the future. With their taxonomic expertise the researchers have made new inroads for future research in this area.

This is a fine example of fundamental and applied research combined.

Belgian Geological Service > **Antarctic Meteorite Storage Facility Complete**

In 2012, the RBINS opened its optimally equipped Curation Centre for Antarctic Meteorites. This is a storage facility and laboratory in which meteorites from Belgian collections can be stored in the best possible conditions and prepared for examination. The Centre is air-conditioned and has all the equipment needed for preparing samples - such as a diamond wire saw. It can also be hermetically sealed.

This type of storage facility for Antarctic meteorites is extremely rare and there are only a few in the entire world.

The Curation Centre was set up as part of the BELAM project, which aims to create a Belgian network to study these meteorites. Partners include the RBINS, the ULB, the VUB and the National Institute for Polar Research in Japan.

The first consignment of Antarctic meteorites, which were collected in the Sör-Rondane mountains in Antarctica as part of the long-running Belgian-Japanese partnership, arrived in 2012. At the polar base, meteorites are collected for about 3 months of the year at locations where the slow ice movements tend to concentrate the finds. Belgian researchers from the VUB and ULB travel to the area to collect them.

Everything found by the Belgian researchers and their Japanese counterparts goes to Japan, where it is thawed under ideal conditions. The bigger samples are sawn in two, one half for the RBINS, and the smaller ones are divided between the two countries.

>
15.09

The Museum played an active role in visits on the theme of "*l'art de construire*" (The art of building), as part of Belgium's Heritage Days 2012.

Palaeontology > **Climate Variation Affected Pleistocene Lemmings**

New research by the RBINS's Palaeontology department, in collaboration with the Stockholm Natural History Museum, indicates how climate variation must have affected populations of collared lemmings in these parts during the Pleistocene period (2.5 million to 11,000 years ago). The study concentrates on collared lemming specimens from the RBINS's palaeontological collection, taken from fossil sites in Belgium, mostly the "Caverne Marie-Jeanne' site in the province of Namur. The DNA study in Stockholm established that there had been a succession of regional extinctions and recolonisations, and that these transitions can be linked to climate changes (cooling) in the late Pleistocene, about 50,000 to 15,000 years ago.

Collared lemmings are small mammals which reproduce easily and have a short generation time. However, serial population extinctions show that populations can be affected by an unstable ecosystem. Parallel results had been published earlier following a study of the arctic fox and, since then, studies on the ordinary lemming, the mammoth, and the snow hare have started or are due to start (they too are based on Belgian fossils from the RBINS's palaeontological collection). The results of this study of collared lemming fossils was published in the widely consulted American journal, "Proceedings of the National Academy of Sciences".

Palaeontology > **Order in the Fossil Plants of the Devonian Collection**

In 2012 and 2013 the RBINS is conducting a thorough review of its collection of Devonian (419 to 359 million years ago) fossil plants, with a view to opening the rich but as yet underutilised collection to scientific research.

The potential of this rich collection has not yet been adequately exploited. The collection is currently being verified, specimen by specimen, and in the second stage of the review, the information will be stored in a database in coded form.

At the same time, the storage area will be reorganised to create more space. The work has already been completed for the Lower Devonian and Middle Devonian, and these collections are now available for consultation. The same process will be carried out for the Upper Devonian, followed by the Carboniferous (359 to 299 million years ago).

The RBINS collection is of international importance, because the Devonian sediments on Belgian territory are rich in fossils of both fauna and flora. The historical collection of the twentieth century palaeobotanist, François Stockmans, is one of the world's largest and most diverse. The RBINS is working with the University of Liège on this review.

> 20.09

The "Nocturnes", Brussels Museums Late Night Openings, season opened with a joint event between our Museum and the nearby Parlamentarium.

> 01.10

A new Cooperation Framework Agreement 2014-2019 was signed with the Belgian Development Cooperation, expanding and refocusing existing activities.

Entomology > Institute acquires 15,000 African Emperor Moths

In Central Africa, the caterpillar of the African emperor moth (Lepidoptera: saturniidae) is consumed by the million, and it is therefore a significant dietary component. So, when it comes to regulating the sale and consumption of this food, it is important that we have a better understanding of the species. It is also important that the caterpillar is sustainably harvested and farmers made aware of this approach. For example, the trees in which the caterpillar grows should not be cut down, but farmers should wait for the caterpillars to fall from the trees in large numbers.

In 2012, the RBINS acquired a collection of around 15,000 emperor moths, which belonged to a biologist who collected butterflies over a thirty-year period. It contains 640 species or close to 95 per cent of the known species in Africa. It also contains many holotypes: the single specimen that has been used to define the species. The DNA barcode is given for 4,000 specimens and there is an accompanying photograph. It is a unique collection of this quite spectacular moth and an indispensible trove of reference material, which will remain intact now that it is held by the RBINS. This is why the emperor moth caterpillar is currently the subject of a GTI project (Global Taxonomy Initiative) run by the RBINS, which studies this edible Congolese caterpillar and its host plants.

Palaeontology > A Complete Insect from the Upper Devonian

In a quarry in the village of Strud near Namur, a team of palaeontologists, of which two were RBINS researchers, found the complete fossilised remains of an insect from the Upper Devonian. What was remarkable was not just that it was a superb, intact specimen, but that the creature had lived in what is known as the "Hexapoda Gap", a 60 million-year period for which no insects had yet been found. As a result, the *Strudiella devonica*, as the creature was christened, earned a place in the prestigious scientific journal, Nature, as well as a great deal of attention in the media.

The approximately 365 million-year old fossil was found as the result of renewed interest in the Strud site. In 1888, Liège-based palaeontologist, Maximin Lohest, published a paper on a jawbone that had been found at the site, but it was not until 2004 that Gaël Clément (Natural History Museum in Paris) determined that it was the jawbone of a tetrapod, related to the Ichtyostega of the Upper Devonian. The RBINS researchers accompanied the team from Clément on the re-excavation of the site, which had at one time been the bed of a freshwater stream. It must have been rich in freshwater fauna and flora, judging by the number of new fish and plant species, crustaceans, chelicerae and tetrapod remains that were found there. One of the most valuable specimens was undoubtedly the intact insect fossil. It is an individual with a body measuring 8 millimetres and large antennae, which could probably fly, although the wings were not preserved.

>
02.10

The Secretary General of CETAF (Consortium of European Taxonomic Facilities) assumed her post while setting up the secretariat offices at the RBINS.

>
18.10

Record interactivity for the exhibition "Prehistory – Do it Yourself", which opened at the Museum with four continuous workshops!


3
PUBLIC

> Attendants become Heritage Guards

In providing our Museum attendants with heritage guard training in 2012, we took a major step towards creating our own, internal security service. In time, the RBINS will also satisfy the legislation on safety and security in public areas. Looked at in principle, the Museum has the choice between hiring a private security firm and setting up its own internal security service.

Since the RBINS already has a team of Museum attendants, who are also willing to attend events and scientific conferences, it was decided to set up an internal security service and so offer Museum staff this new career opportunity.

However, security guard training has never quite been appropriate to the Museum setting. For this reason, the association of museum workers, ICOM Belgian/Flanders, advocated long and hard on a special heritage guardianship course, in which participants are given added training in how to deal with Museum collections. The heritage guardian course was made available to RBINS attendants in 2012. A total of 29 people took part in the training sessions. The course lasted a total of 72 hours and everyone passed the final examination. Since then, a security room has been added, and once the new member of staff, who is due to arrive in 2013, has completed the dedicated management course, we will be able to say that the internal security service is in place.

> Articles Defeat Creationist Ideas

A critical analysis by researchers at RBINS in late December 2011 of the infamous "Atlas of Creation" (a book by Turkish creationist Harun Yahya, which attempts to win teachers and lecturers over to creationist ideas on an international scale), has been very well received. With it, the RBINS is playing an active part in refuting pseudoscientific creationist ideas and at the same time helping teachers, Museum guides and scientifically minded people to argue coherently and effectively against creationism.

The beautifully illustrated "Atlas of Creation" has been translated into many languages and attempts to refute evolutionary theory by placing pictures of fossils alongside photos of recent, similar-looking organisms. Their similarities supposedly demonstrate that the organisms have remained unchanged and that no evolution has taken place. The first of the researchers' articles exposed the book's scientific shortcomings: errors in scientific naming, taxonomic identification, classification and data analysis. It also showed that the book gives false supporting evidence. The article was widely disseminated via the Internet and in 2012 was translated and published by the Turkish popular science magazine "Bilim ve Gelecek" (Science and Future). This publication led to a hilarious and vacuous reply by the influential Harun Yahya during a talk show on his own television channel, A9. On the other hand, the article led to a request for a similar publication in another Turkish popular science magazine, "Bilim ve Utopya" (Science and Utopia). The second article is due for publication in 2013.

>
31.10

34 young visitors aged 8-14 years old experienced the thrills of Halloween night ... by spending it at the Museum!

>
09.11

The cedar wood iguanodon, a work by Yves Bosquet and the emblem of our Museum for the past twenty years, was refurbished by the artist.

> Prehistory Do It Yourself!

From 18 October 2012, to 26 May 2013, the RBINS hosted the remarkable exhibition "Prehistory Do It Yourself!", which is even more interactive, if that were possible, than the Museum's other exhibitions. The exhibition features four permanent workshops that allow visitors to get "hands-on". These workshops cover working in stone, hunting, working with hide and making fire.

"Prehistory Do It Yourself!" is the result of a collaboration between the RBINS and the Ramioul prehistoric site in Flémalle. Now twenty years old, this "Préhistosite" is currently undergoing a total renovation. As a result, its doors will close for some two years. The Ramioul Préhistosite was thus a sort of "Museum in residence" at the RBINS. The Ramioul staff have brought along their experience and some experimental, archaeological material. This, combined with the RBINS's archaeological collection and museum development know-how, allows us to reveal something of day-to-day life in prehistoric times.

> The Young Witches and Wizards Trail

The RBINS Museum has all kinds of exhibition rooms, each with its own appeal. There is much to see and do, so it can be fun sometimes to give visitors a helping hand along the way.

Which is why the Communication department came up with a free trail for families and children from 8 to 12 visiting the permanent collections.

On this "Young Witches and Wizards Trail", visitors were able to go in search of "wizards' favourite pets", and "the ingredients of their magic potions", etc. This they did with the help of a "parchment checklist" to guide them through the Museum (250 years of Naturals Sciences, BiodiverCITY, the Whales and the Insects).

Between 1 July and 1 November 5,700 visitors followed the trail. The last copies were handed out at Halloween and checklists could also be downloaded from the website.

>
15.11

Organisation of the Geoheritage, Geoconservation & Geotourism forum for the Belgian National Committee of Geological Sciences (Royal Academy).

>
21.11

The association Belgian Women in Science (BeWiSe), whose head office is at the RBINS, celebrated its tenth anniversary at the institute.

> Café Workshop for Adults

The overwhelming majority of visitors to the RBINS Museum are schoolchildren and families with children. Having said that, the Museum has a great deal to offer other age groups. With its new "Café Workshop" initiative, the Education department is attempting to attract an adult audience during the week.

On weekdays, adults can discover the Museum interactively on a guided tour. The workshop consists of a guided tour, a lively discussion of the subject in question and, of course, a break for coffee and a sticky bun. It takes place in the Museum rooms and WiFi zone, to allow visitors a rest during the 2-hour activity.

The first series of four Café Workshops looked at human and animal senses under the title "*Le plein des sens*". Interest in the first three Workshops of 2012 was modest. But since it was only the starting phase, there had been little in way of publicity.

The programme for individual participants yielded a few indirect requests about the Café Workshops from groups. The initiative also provided an inroad to the Museum's collections for the visually impaired.

> International Biodiversity Day

As home of the National Focal Point for Biodiversity, the RBINS always champions an interesting initiative on International Biodiversity Day (22 May). The international Convention on Biological Diversity (CBD) opted to focus on marine biodiversity in 2012. Of course, Brussels is not on the coast, so the RBINS chose to team up with the Federal Public Service Environment on this occasion, to produce a virtual campaign that would reach out to all Belgians.

The popular characters of Gust Vandekust and Suzette Lacrevette drew attention to the problems of overfishing, pollution and invasive species in a light-hearted way. An extensive communication plan (based on the websites www.ouestsuzette.be and www.waarisgust.be, a newsletter and promotional campaigns in all media) helped refocus awareness on the subject of biodiversity.

The federal government ensured extra visibility and support. No fewer than two ministers, Johan Vandelanotte and Melchior Wathelet, guided children through the Museum's marine life exhibits and, in so doing, drew the children's attention to the importance and vulnerability of the marine environment.

In the week after the campaign more than 9,000 people visited the websites to make a total of 3,098 pledges for a better marine environment. That success continued via the sites. And the press took the campaign to every corner of the country.

>
22.11

A prehistory-style dinner was held alongside the exhibition "Prehistory – Do it Yourself", as part of Brussels' Year of Gastronomy.

> X-Tremes tops A Million Visitors

Three years of preparation have finally paid off: the touring exhibition entitled "Surviving in the X-treme", created from 2003 to 2006 by three European natural science institutions, among them the RBINS, reached the milestone of 1 million visitors in 2012.

X-Tremes came about as the result of a fruitful partnership between the "Naturalis" biodiversity centre in Leiden in the Netherlands, the "Experimentarium" science centre in Copenhagen, Denmark, and the RBINS. The exhibition gives visitors the opportunity to "survive" alongside several remarkable animals and plants found in the most inhospitable areas on Earth, and does so with the help of thirty exhibition modules containing life-size fauna, interactive games, films and sound effects.

The exhibition started out on its journey to a number of European institutions in 2006. Along the way it has reached about 1.1 million interested visitors.

The exhibition's success implies a modest source of income for the three partners, despite the work involved in its assembly, maintenance and travel. But, above all, the travelling "X-Tremes" exhibition spreads the name and reputation of the three partners far and wide. The tour is set to continue at least until the end of 2014.

> Night Watchman on Tour in Brussels

Visitors don't just come to our Museum, sometimes the Museum comes to them. For twenty-five years the Brussels Nature Education Centre (BNEC), an internal unit of the Education department, has partnered the Museology department to send active participation exhibitions on the subject of Man and nature out to audiences of 6 to 12-year-old schoolchildren in the Brussels Region.

As a rule, each new exhibition travels the region for a couple of years and receives about 6,000 to 7,000 participants. Then, after two years, the exhibition can be put out to hire to other municipalities. The BNEC also offers the exhibition to interested parties on certain dates and for specific events.

The new exhibition, which was launched on 11 September 2012, is called "Night Watchman", and will tour municipalities until the end of the school year in 2014. The exhibition actually supports a workshop run by a BNEC guide. It is divided into four parts, each of which offers the space and equipment needed to observe and understand. These active participation exhibitions exist by virtue of an agreement with the Brussels Region, which funds the BNEC, to allow schoolchildren to take part free of charge.

>
01.12

Launch of an international "bees and pollinators" network, under the auspices of the CCPIE; Coordinating Committee for International Environmental Policy

>
07.12

The Royal Belgian Entomological Society and the curators from the Entomology department organised the symposium Entomology in Belgium.

> New City Rivers

The RBINS aims to make a gesture of openness to the community by working with a number of partners in its immediate vicinity. The creation of a biodiversity trail in Leopold Park is one such project that could help unite local residents and clubs, the institutions based in and around the Park, the politicians and the scientific experts at the RBINS

As part of the European "PLACES" project, which aims to encourage communication and cooperation between scientists, politicians and citizens at the local level, the RBINS joined the Brussels Platform of the States General for Water, the Urban Maalbeek project and many other organisations, on 25 May 2012, to organise an information event explaining the concept of "New City Rivers". New City Rivers promotes new forms of water management in the urban environment.

Through the project the RBINS intends to help create a biodiversity trail in Leopold Park. On the same day, a complete dossier relating to a possible redesign of Leopold Park was presented, with a view to improving management of the water and the flora and fauna that depend on it. The dossier also identifies interesting areas for biodiversity, potential observation points, and sites for special trees or citizen planted flowerbeds. It also provides information on the Park's history and the redesign of the children's play areas.

> 15% more Visitors

As a result, the rise in visitor numbers in 2012 is very pleasing, because it shows that the effect of the 2008 reopening was not a one-off, and that the Museum is still an attraction. For that matter, the ongoing surveys conducted across federal scientific institutions reveal that visitors gave the Museum 8 out of 10 for satisfaction.

The Museum of Natural Sciences had the pleasure of welcoming 323,000 visitors in 2012. This figure represents a very fine, indeed, remarkable increase of fifteen per cent compared with 2011. The 300,000th visitor entered the Museum on 6 December, Saint Nicholas Day, an event that was celebrated with all of the Museum staff.

In the more distant past, before the renovation of the Dinosaur Gallery, the Museum received an average of 270,000 visitors every year. In 2008, when the new Gallery opened to the public, every record was broken. That year, a good 353,000 curious visitors descended on the Museum, an increase of forty per cent.
It seemed inevitable that the numbers would fall after such a good result, but that fall came much sooner and was much sharper than expected: in 2011 the Museum received only 280,000 visitors.

Aside from the weather, which does come into play when deciding whether or not to visit a Museum, it seems that these fluctuations in visitor numbers can be explained by two factors. First, temporary exhibitions are an important element, and there were none in 2010 and 2011, whereas the Museum hosted "Senses" and "Prehistory Do it Yourself!" in 2012.

Second, the permanent collection became better known and its reputation better established in the tourist guides following the renovation. TripAdvisor, the Internet review site, actually places the Museum in the top 3 under the heading "What to do in Brussels?"

> 14.12

The Congo Network project was launched by the Congo Biodiversity Initiative and its Congolese counterparts to support the Centre de Surveillance de la Biodiversité (Centre for biodiversity surveillance).

> 31.12

We finished the year on a high note: the Museum's visitor counter for 2012 recorded 323,000 visitors!

4

FIGURES

> FINANCES

Income in 2012 exceeded €30 million for the second time. Expenses remained slightly below income and the Institute's investment capacity remained significant. Key elements in this development are outlined below.

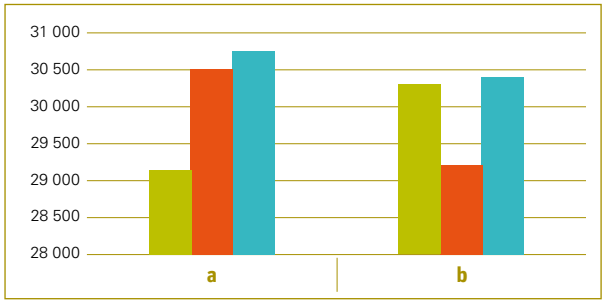
Own **income** for 2012 was on a par with 2011, up slightly by 0.5%. It should also be noted that there was better use of staff funds. The allocation increase of €123,000 was intended to partially offset the Institute's payment of VAT on expenses associated with the research vessel, the Belgica (± € 250,000).

Excluding the staff budget, the Institute's overall expenses rose 6% between 2011 and 2012. Taking into account the exceptional acquisition of a remote sensing radar for the North Sea surveillance plane (€900 K, funded by the Belgian national lottery), this increase was only 1.26%.

- Ordinary operating expenses were up 2.54% in relation to 2011.
- Expenses for the Belgica reached €2,330 K in 2012 (30% of the allocation).
- Staff costs covered by own resources were down 1%. The most significant decrease concerned staff covered by federal funding (section 2, -13%), which was primarily associated with the end of funding for the digitisation project.

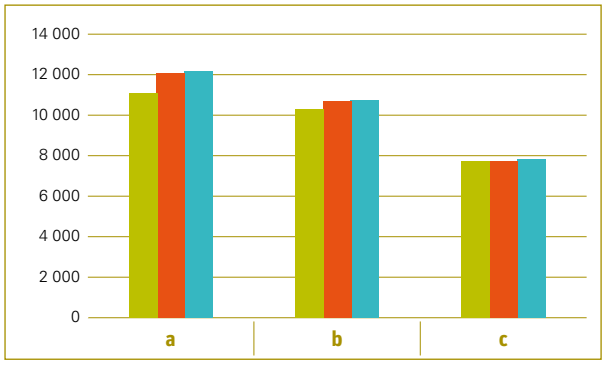
INCOME AND EXPENSES (IN €k)

	2010	2011	**2012**
a Income	29 143	30 508	30 754
b Expenses	30 303	29 218	30 406
Balance	-1 160	1 290	**348**



SOURCES OF INCOME (IN €k)

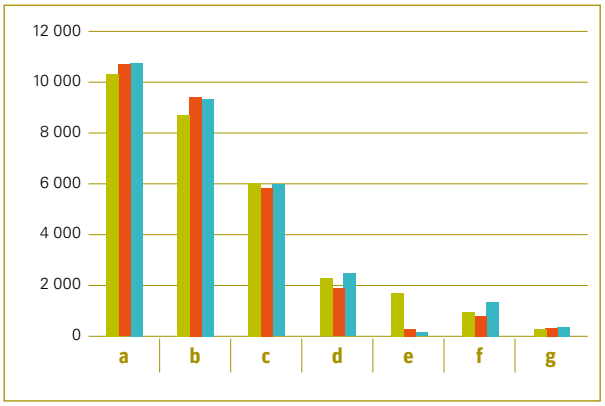
	2010	2011	**2012**
a Museum's own income	11 095	12 088	12 157
b Staff budget*	10 322	10 694	10 748
c General grant	7 726	7 726	7 849
Total	29 143	30 508	**30 754**



* Statutory and contractual staff are at the expense of the Belgian Science Policy Office.

SOURCES OF INCOME (IN €k)

	2010	2011	**2012**
a Staff budget*	10 322	10 694	10 748
b Staff expenses financed from own resources	8 712	9 424	9 345
c Ordinary operational expenses	6 034	5 830	5 978
d Operation flight equipment/vessels	2 270	1 876	2 467
e Investment in the Museum	1 708	292	153
f Equipment	964	787	1 358
g Library and collections	293	315	357
Total	30 303	29 218	**30 406**

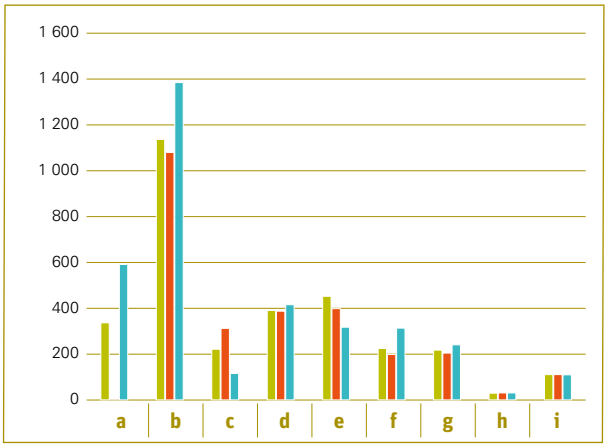


BREAKDOWN OF MUSEUM INCOME (IN €k)

In 2012, the Museum had 323,940 visitors, an increase of 16.1%. 90,760 of these visitors visited the temporary 'Senses' exhibition (over a period of eight months) and 24,798 visited the 'Prehistory – Do it Yourself' exhibition (over a period of two and a half months).

These excellent figures naturally had an impact on income from ticket and shop sales. There was, however, a significant drop in profits from exhibition rentals. This 50% decrease was linked with the end of the tour of the Murder at the Museum exhibition.

	2010	2011	**2012**
a Museum renovation grant	336	0	591
b Ticket sales	1 137	1 080	1 385
c Exhibition hire and sales	221	312	115
d Shop	390	387	415
e Donations - sponsorship - grants	452	398	317
f Educational Service	224	198	313
g Events	217	204	240
h Cafeteria concession	29	30	30
i User Observatory (all federal Museums)	110	110	109
Total	3 116	2 719	**3 515**

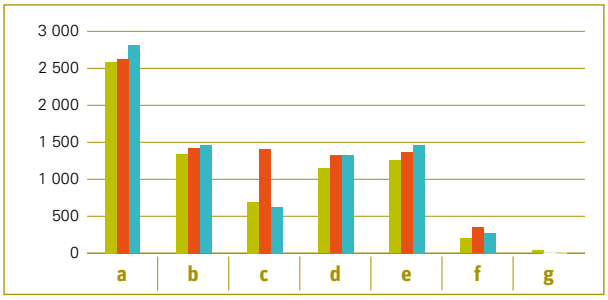


BREAKDOWN OF RESEARCH INCOME (IN €k)

Between 2009 and 2011, income from research and studies rose by more than 25% to top the €8 million mark. Although there was a 6% decrease compared with 2011, research remained significant in 2012.

Federal grants represented more than half of the contract research revenue. The about turn seen in 2011, where the majority of funding no longer came from federal sources, was not borne out. Resources from the private sector continued to rise, up 7% on the previous year. These revenues were primarily linked with impact assessments carried out under wind power projects.

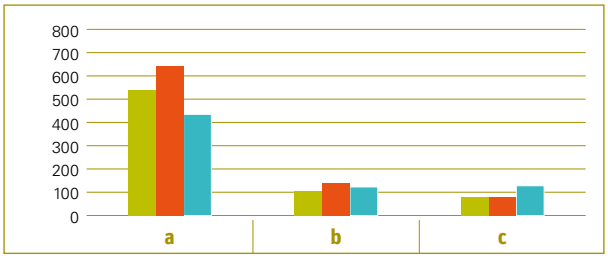
Projects financed by	2010	2011	**2012**
a Belspo	2 583	2 626	2 808
b Federal administrations (excl. Belspo)	1 343	1 420	1 456
c European Commission	695	1 408	624
d Belgian federal bodies	1 145	1 323	1 329
e Private sector	1 255	1 371	1 464
f Foreign institutions (non-EU)	197	347	275
g Belgian universities	36	1	0
Total	7 254	8 496	**7 956**



BREAKDOWN OF MISCELLANEOUS INCOME (IN €k)

In addition to major funded research projects, scientific departments record various incomes related to their ordinary activity (laboratory analyses, organisation of seminars, sale of geological maps, etc.). The increase in income linked with scientific activities is mainly related to impact studies.

	2010	2011	**2012**
a Scientific activities	540	641	435
b Social activities (mess, crèche)	104	141	123
c Management	81	81	128
Total	725	873	**686**



> STAFF

While the number of statutory science staff increased, for the first time in several years, that of statutory non-science staff decreased significantly by nearly 10%. This figure bears out the malaise associated with onerous staff recruitment procedures, which could hold back the Institute's development.

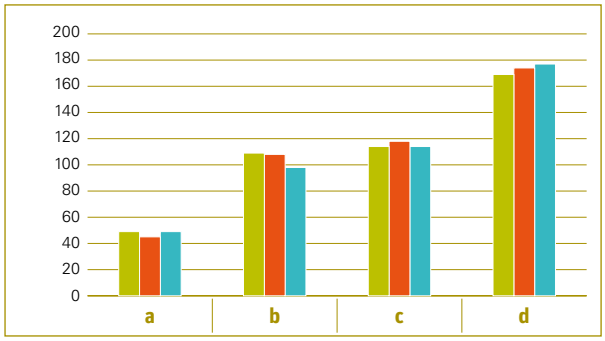
The number of non-statutory staff did not rise, contrary to the trend seen in the past. Within this category of staff, there was a significant decrease in numbers on external projects.

This was partly associated with the transfer of staff from the DIGIT project to the Belspo budget, but there was also a slight decrease for other projects. This is not a fundamental trend as projects fluctuate over time.

Overall, the Institute's workforce decreased by 1.5% without, however, a drop in activity.

STAFF BREAKDOWN

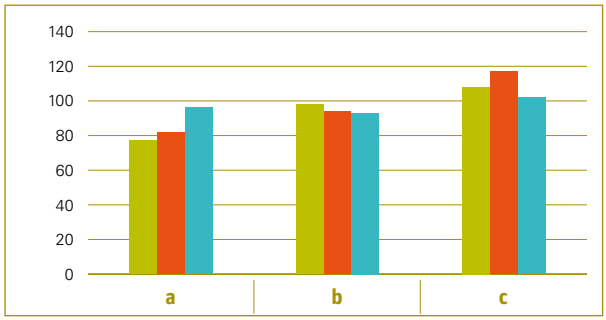
	2010	2011	**2012**
a Statutory scientists	49	45	49
b Statutory non-scientists	109	108	98
c Contractual scientists	114	118	114
d Contractual non-scientists	169	174	177
Total	441	445	**438**



SOURCES OF FINANCING FOR CONTRACTUAL STAFF

	2010	2011	**2012**
a Staff budget*	77	82	96
b Grant and ordinary income	98	94	93
c External projects	108	117	102
Total	283	293	**291**

* Contractual staff is at the expense of the Belgian Science Policy Office.

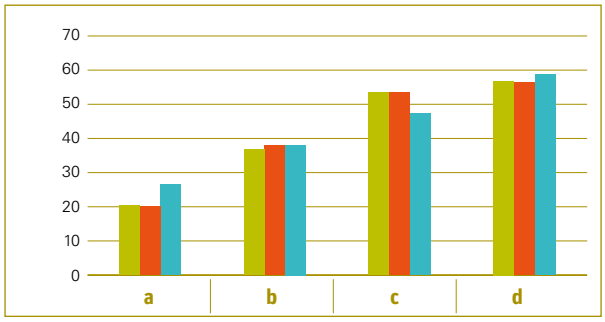


PERCENTAGE OF FEMALE STAFF

Overall, the gender ratio was once again near equal.
However, there were still imbalances within categories, with more men among the statutory staff. But one encouraging sign was the increase in female staff in the statutory scientists category, which may reflect a growing interest in science careers.

Among the contract staff, women remained in the majority overall, easily exceeding the 50% mark for non-science contract staff.

	2010	2011	**2012**
a Statutory scientists	20,4	20	26,5
b Statutory non-scientists	36,7	38	38,1
c Contractual scientists	53,5	53,4	47,4
d Contractual non-scientists	56,8	56,3	58,8
Total	47,1	47,4	**47,5**



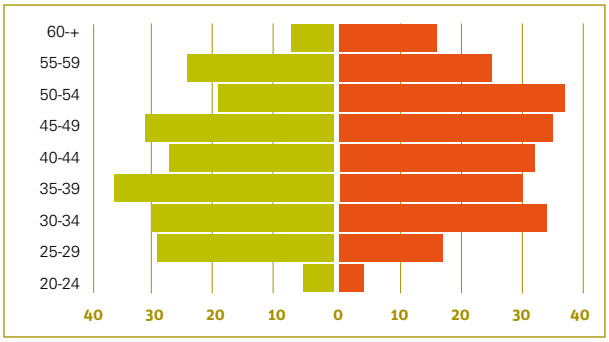
AGE PYRAMID

The average age of the workforce slightly increased, standing at 42.6 against 42.0 in 2011.

	Femmes	Hommes
60-+	7	16
55-59	24	25
50-54	19	37
45-49	31	35
40-44	27	32
35-39	36	30
30-34	30	34
25-29	29	17
20-24	5	4
Average age: 42,6 years		

This partly reflects the ongoing issue of the sizeable number of staff aged 55 and over, most of whom are men, who accounted for 16.5% of our workforce at the end of 2012. This situation, combined with the slowness of certain recruitment procedures, poses a concern for the Institute's future successful operation.

As in previous years, most of the female staff fell in the 20-40 age bracket.

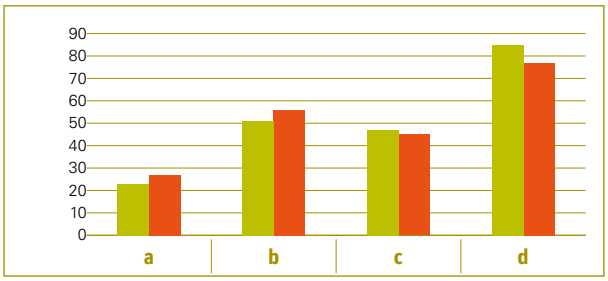


STAFF BREAKDOWN BY LINGUISTIC ROLE

The overall workforce was almost perfectly balanced (206 FR / 205 NL), taking into account the particular situation of staff based in Ostend (17 people) and foreign staff. This was also the case for statutory staff, whose recruitment is the most structural (70 FR/72 NL).

	FR	NL	Étr.	Ost.
a Statutory scientists	23	27	-	1
b Contractual scientists	51	56	4	3
c Statutory non-scientists	47	45	-	6
d Contractual non-scientists	85	77	6	7
Total	**206**	**205**	**10**	**17**

However, there was some imbalance among both statutory and contractual science staff, which was offset by the non-science figures.

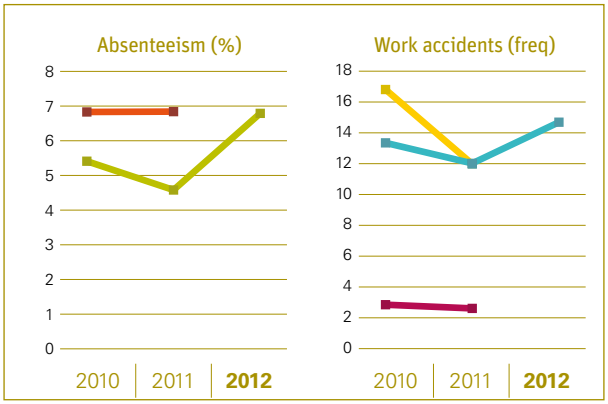


ABSENTEEISM AND WORK ACCIDENTS

The figures for both absence due to illness and accidents at work rose in 2012. As regards absence due to illness, it would be interesting to make a comparison with absenteeism at the federal level for 2012 (figures that were not yet available at the time of writing this report). The Institute's 2012 figure is in fact very close to the federal figure for 2011.

	2010	2011	**2012**
Absenteeism RBINS (%)	5,41	4,58	6,79
Absenteeism federal level (%)	6,83	6,84	n.d.
Work accidents RBINS (frequency)	13,35	12,02	14,69
Work accidents R&D (frequency)	2,85	2,61	n.d.
Work accidents Museums (frequency)	16,81	11,98	n.d.
Work accidents RBINS (number)	10	9	11
Accidents RBINS on the way to work (number)	13	10	5

The rise in the number of accidents at work has led the Institute's management to increase their efforts in staff training and information.
However, the number of accidents on the way to work decreased significantly.



> RESEARCH

The figures for 2012 have decreased compared to previous years, which had however been particularly fruitful. The positive is the steady high level of publications with Impact Factor (IF), reflecting recognition to the high quality work of our researchers. On the other hand, the Institute produces less reports of expertise, confirming the trend of 2011.

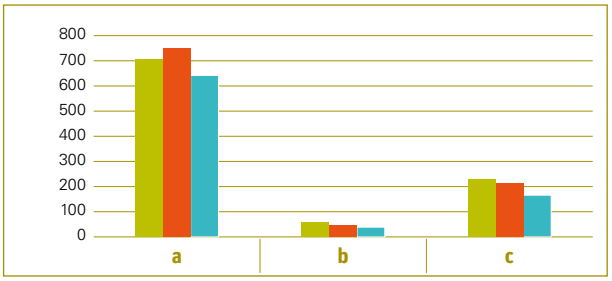
If the most active departments are Paleontology, Education & Nature and Marine Ecosystem, however, it should be noted:
- that the researchers workforce differs significantly from a departments to the other ;
- the Invertebrates department has a particularly high rate of publications with IF (nearly 30% of its total publications).

BREAKDOWN OF PUBLICATIONS

	Scientific publications				Popular works	Expert reports	Total
	Total	*of which journals with IF*	*of which journals with international editorial board*	*of which others*			
Vertebrates	39	*9*	*2*	*28*	8	8	**55**
Invertebrates	97	*34*	*9*	*54*	1	25	**123**
Entomology	59	*16*	*12*	*31*	0	8	**67**
Education & Nature	130	*33*	*18*	*79*	10	19	**159**
Palaeontology	170	*46*	*15*	*109*	4	52	**226**
Marine Ecosystem	85	*15*	*8*	*62*	9	47	**141**
Geology	62	*7*	*5*	*50*	7	7	**76**
Museum	0	*0*	*0*	*0*	0	0	**0**
Total	**642**	***160***	***69***	***413***	**39**	**166**	**847**

CHANGE IN PUBLICATIONS

	2010	2011	**2012**
a Scientific publications	772	704	642
b Popularisation	44	59	39
c Reports	162	229	166
Total	978	992	**847**



SCIENTIFIC PROJECTS WITH EXTERNAL FUNDING

In 2012, the number of contracts managed by the Institute, alone or in partnership, rose to 178; this represents a growth of 14.1% and bears out the significant role played by the Institute both in Belgium and on the international stage.
All of the RBINS' departments contributed to this success, with three of them – Marine Ecosystems, Education & Nature and Geology – being particularly busy, accounting for 64% of the total.

	Projects with external funding
Vertebrates	13
Invertebrates	18
Entomology	8
Education & Nature	33
Palaeontology	19
Marine Ecosystems	52
Geology	29
Other	6
Total	**178**

BREAKDOWN OF CURRENT PROJECTS ACCORDING TO SOURCE OF FINANCING

While the number of contracts managed in 2012 greatly exceeded that of 2011, the cash flow generated by these contracts was lower than the previous year. Looking at the source of these contracts, the Belgian Federal Science Policy Office was by far the biggest sponsor, with an increase of 22,7%; but contracts generated by the European Community and the private sector also saw considerable growth, rising 28.6% and 25% respectively.

	2010	2011	**2012**	**2012**
	Number	**Number**	**Number**	**Amount (in €)**
Belgian Science Policy Office	70	66	81	2 916 673
Federal funding from other sources	12	12	12	1 257 674
National Lottery	3	5	2	198 328
Flemish Region + FWO	10	13	12	577 767
Walloon Region + FNRS	3	6	5	511 980
Brussels-Capital Region	3	4	6	263 067
Universities	5	3	2	-
European Commission	29	28	36	624 143
International	12	12	15	274 793
Private sector	8	7	7	1 463 654
Total	155	156	**178**	**8 088 080**

SUPERVISION OF STUDENTS

Doctoral and Master's supervision, although not up to the same level as the record high of 2011, demonstrates the Institute's significant impact as regards overseeing the work of young researchers. In relation to 2011, there was a good balance between the number of doctoral students and Master's students. It should be noted that this report only covers work (co)sponsored by a staff member of the Institute.

Within the departments, particular mention should be made of the significant contribution by Palaeontology, Anthropology and Prehistory(33.6 %), while the Invertebrates, Education and Nature, Marine Ecosystem and Geology departments were also very involved.

CHANGE IN SUPERVISION OF STUDENTS

	2010	2011	**2012**
PhD	56	81	69
Master	65	68	65
Total	121	149	**134**

BREAKDOWN OF THE SUPERVISION OF STUDENTS

	PhD	Master	**Total**
Vertebrates	5	0	5
Invertebrates	12	9	21
Entomology	3	3	6
Education & Nature	17	6	23
Palaeontology	11	34	45
Marine Ecosystem	9	8	17
Geology	12	5	17
Total	**69**	**65**	**134**

> LIBRARY

Book and journal purchases were consistent at around 8,000, which shows the effort made to maintain the rich content of our classical library to a high standard. The number of e-journal subscriptions was close to 850 at the end of 2012, confirming the growth of this type of media.

Unlike previous years, the figures for internal document loans showed barely any drop.
The annual report for Impala (the electronic library management system in Belgium) showed substantial figures for the Institute, demonstrating the attractiveness of our library, even if those figures were slightly down by 5%.

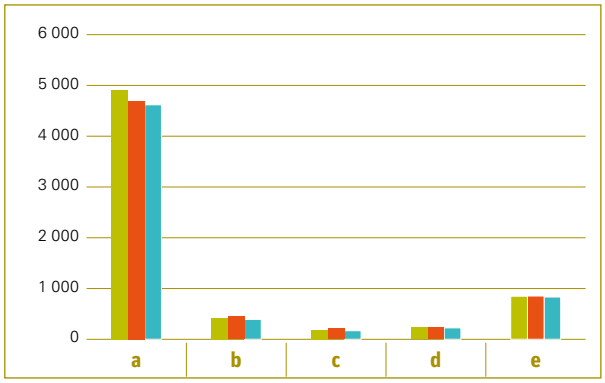
E-journal consultations, up 8%, confirmed the strong trend observed in recent years as regards science readers' habits.

ACQUISITIONS

	2010	2011	**2012**
Books and journals	+ 8 291	+ 8 068	+ 8 174
Electronic journals	+ 42	+ 59	+ 83

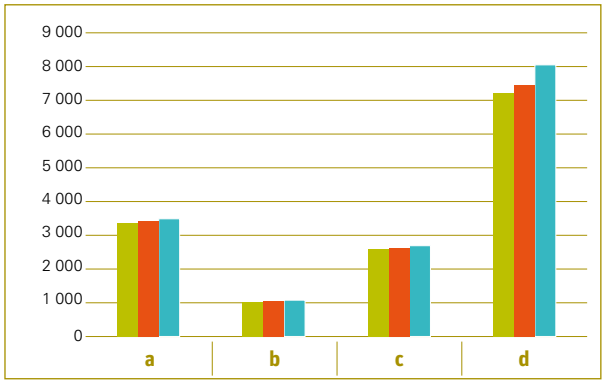
LOANS

	2010	2011	**2012**
a Internal loan of documents	4 907	4 690	4 619
b Inter-library loans	414	447	390
c Borrowings	179	211	167
d Loans	235	236	223
e International exchanges	847	851	831



TYPES OF CONSULTED ELECTRONIC DOCUMENTS

	2010	2011	**2012**
a Periodicals	3 351	3 419	3 487
b Abstracts	1 014	1 047	1 075
c Complete text	2 589	2 611	2 689
d Total consultation sessions	7 207	7 455	8 051



> COLLECTIONS

SCIENTIFIC VALORIZATION

Compared to 2011, the number of visiting scientists decreased, confirming the trend already noticed in the past. This is a result of developments in the provision of our collections and databases. The work carried out to digitise our collections and the online publication of our databases offers a growing number of researchers the possibility of consulting these remotely. Four departments however had a significant number of visitors: Invertebrates, Entomology, Palaeontology and Geology.
Additions to the collections followed the trend of previous years. As in past years, these additions came from specific purchases and a few donations, the latter being fewer in number than in 2011. However, the number of loans was consistent at around 300, with a marked interest in the Entomology and Invertebrates departments. The interest in our collections, both for scientific research and for presenting an exhibition, was proven once again.

	Number of visiting scientists	Additions to the collections	Number of loans
Vertebrates	48	1 631	25
Invertebrates	103	379	7
Entomology	169	185 051	276
Education and Nature	25	0	0
Palaeontology	98	1 887	8
Marine Ecosystem	23	136	0
Geology	99	1043	6
Total	**565**	**190 127**	**322**

DIGITISATION OF THE COLLECTIONS

Two departments, Entomology and Palaeontology, carried out a major portion of the encoding work, accounting for 66.1% of the total. The total encoding figure, compared with that of the encoding in the DaRWIN database (49,911 against 46,230) shows the need to continue our efforts to standardise/rationalise our databases.

While type specimen registrations were similar to the previous year (1,505 compared to 1,545), the number of non-type specimen registrations increased significantly by 21.0%, despite the equally difficult circumstances in terms of available resources.

Moreover, the percentage of the work represented by updates and deletions, while remaining high at 34.3% of the total, was similar to the previous year. The work achieved in 2011, with the provision of a new version of DaRWIN, gave us an impressive result for the end of 2012, as 455,376 items had been registered.

ENCODING PER DEPARTMENT	
Vertebrates	18 594
Invertebrates	3 987
Entomology	8 306
Palaeontology	14 401
Geology	4 623
Total	**49 911**

BREAKDOWN OF ENCODING TASKS (%)	
Addition of data	65,7
Updating of data	24,5
Deletion of data	9,8

ENCODING IN THE DaRWIN DATABASE			
	Recording of types	Recording of non-types	Total items recorded in DaRWIN
January	27 070	382 078	409 148
February	-	-	-
March	-	-	-
April	27 928	397 866	425 794
May	28 010	401 760	429 770
June	28 097	407 140	435 237
July	-	-	-
August	28 198	414 542	442 740
September	28 283	417 781	446 064
October	28 440	420 587	449 027
November	28 507	422 807	451 314
December	28 575	426 803	455 378
Increase	**1 505**	**44 725**	**46 230**

> MUSEUM

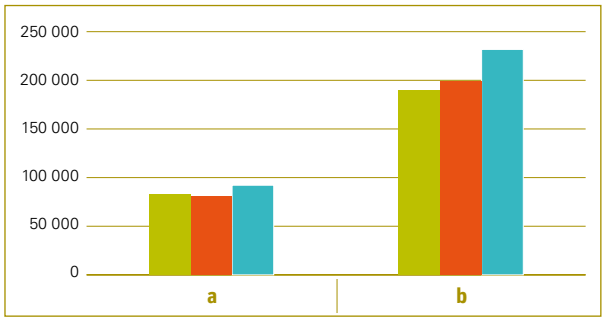
After two adverse years, the number of visitors to the Museum took an upward turn and once again significantly exceeded the 300,000 mark with an increase of 16.1%. This about turn was due to the success of our temporary exhibitions. In fact, in 2011, the period covered by a temporary exhibition was particularly short at just three months. This once again underscores the importance of temporary exhibitions, the exception remaining the opening of particularly attractive permanent galleries, such as the dinosaur gallery.

This growth concerns groups, as well as individuals and families, although the increase in the latter category was slightly higher at 16.8% compared to 14.4%.

Visitors to off-site exhibitions still accounted for a significant percentage of total visitors to our exhibitions, reflecting the success of our joint exhibitions abroad.

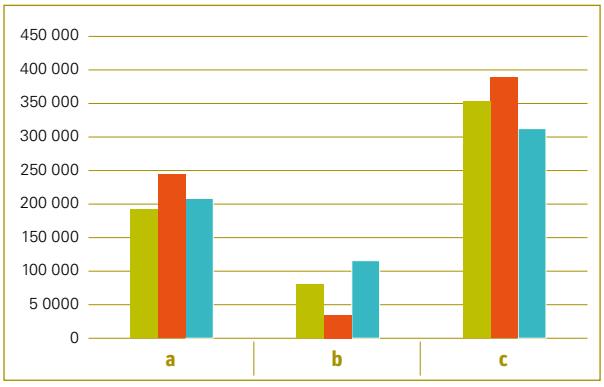
CHANGES IN MUSEUM ATTENDANCE

	2010	2011	**2012**
a Visitors in groups	82 393	80 544	92 172
b Individuals and families	189 541	198 500	231 768
Total	271 934	279 044	**323 940**



BREAKDOWN OF MUSEUM ATTENDANCE

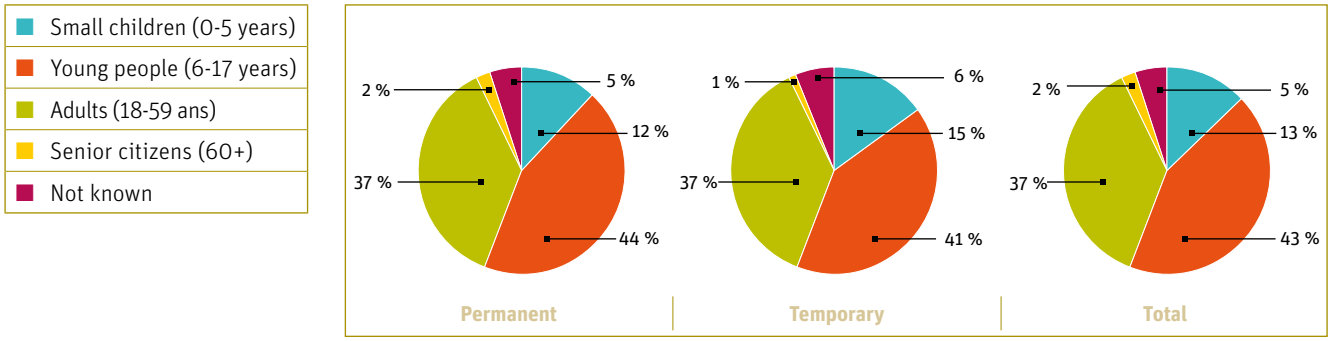
	2010	2011	**2012**
a Permanent galleries	191 926	244 648	208 404
b Temporary exhibitions (on-site)	80 008	34 396	115 536
Total Museum	271 934	279 044	**323 940**
c Temporary exhibitions (off-site)	353 000	389 000	312 500



BREAKDOWN OF VISITORS BY AGE GROUP (%)

Children (0-5 years old) accounted for a significant portion of our visitors, their numbers rising constantly, whether in a group of accompanied by their parents or grandparents.

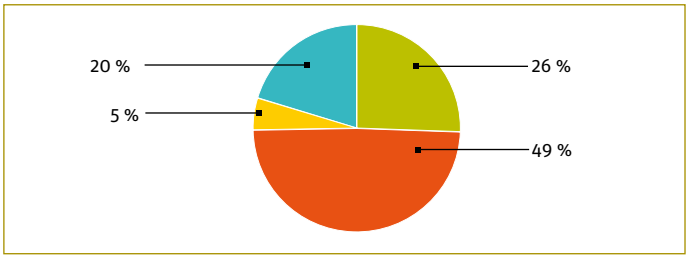
However, there was a relative decrease in young people (6-17 years old), with attendance data for activities by the Museum's Education department revealing that this situation mostly concerns the 12-17 age bracket (secondary school).



REDUCED AND FREE ADMISSION

The percentage of visitors benefiting from free entry (1st Wednesday of the month or other) was remarkably similar to 2011; this also goes for visitors benefiting from concessions. In total, only 26% of our visitors paid the full price, reflecting the relative significance of the number of very young visitors (0-5 years old), efforts made to open the Museum to more disadvantaged population groups, and various initiatives taken by the Institute alone or in cooperation with other institutions (Brussels Card, SNCB, etc).

	Number
Full admission	83 231
Reduced admission	159 463
Free admission on 1st Weds of month	16 219
Other free admission	65 027
Total	**323 940**



VISITS TO WEBSITE

Contrary to the previous year, the number of web page views rose slightly once again, by 0.7%, a level that reflects our virtual visitors' interest in the Institute and its Museum.
The same trend, but more noticeable, can be seen for visitors to our site whose numbers rose 4.3%, almost reaching the all-time high recorded in 2010, which was bolstered by the Year of Biodiversity.

	2010	2011	**2012**
Pages	14 034 726	11 509 570	11 590 095
Visitors	3 076 161	2 924 777	3 051 811

CHANGE IN SHOP CUSTOMERS

The number of visitors to the shop rose 7.8%, a lower increase than that of the number of visitors to the Museum. This is relatively typical, regardless of whether the figures rise or drop.
Expenditure per customer continued to rise slightly, reflecting in part the increase in product prices. Despite these price increases, expenditure per visitor was slightly down, no doubt in connection with the relative increase in the number of very young visitors.

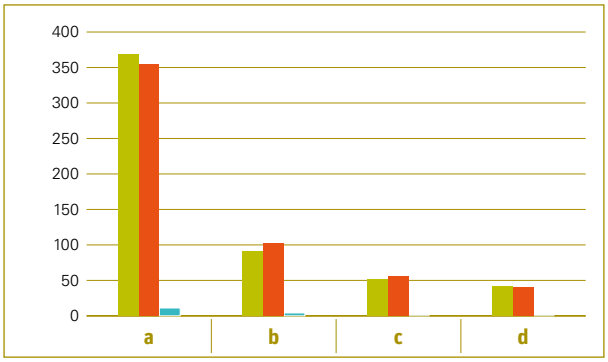
	2010	2011	**2012**
Museum visitors	271 934	279 044	323 940
Shop customers	26 494	25 688	27 693
Expenditure/customer	14,51	14,76	14,79
Expenditure/visitor	1,41	1,36	1,27

THE MUSEUM IN THE MEDIA

Overall, the Institute's coverage in the printed media was down on the previous year (728 against 846), but this trend differs by press: FR (down 82), NL (down 36) and the international press (up 5). This decrease is mostly associated with the significant decrease in articles relating to the Year of Biodiversity and the BiodiverCITY gallery.

	FR	NL	Others
Printed press			
Articles Museum and Institute	334	313	7
Exhibition Mars	16	17	3
Exhibition Senses	18	25	1
Biodiversity + expo BiodiverCITY	0	0	0
a Total printed press	**368**	**355**	**11**
b *of which interviews RBINS employees*	91	102	4
Radio and TV			
c Total Radio and TV	**51**	**55**	**0**
d *of which interviews RBINS employees*	42	40	0

However, in 2012, there was a clear increase in the number of interviews of RBINS staff (197 against 81), both in the FR press and the NL press. An increasing number of articles are being provided by our staff, particularly the scientists.
As concerns radio and TV coverage and staff interviews in these media, the figures were similar to the previous year, with appearances by members of our staff remaining high, accounting for approximately 78% of the cases.



ACTIVITIES ORGANISED BY THE EDUCATIONAL SERVICE

While the relative increase in the total number of participants at educational activities slowed in 2012, up 2.8% against 8.7%, the number of individual participants at activities organised by the education department rose significantly by 25.2%, reflecting the growing attractiveness of these activities among our individual visitors.

The number of activities remained high (close to 2,900), with an average attendance close to 20 people, well in line with the optimum group size.

	2010	2011	**2012**
Number of participants	50 965	55 387	56 912
of which groups (on-site + off-site)	*47 155*	*50 911*	*51 308*
of which individuals	*3 810*	*4 476*	*5 604*
Number of activities organised	2 768	2 828	2 886
Average attendance per activity	18,4	19,6	19,7

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

As regards the SEED indoor activities, participant numbers did not increase with the number of visitors to the Museum, resulting in a significant decrease in the percentage of supervised visitors, particularly among groups, which was down 6.3%.

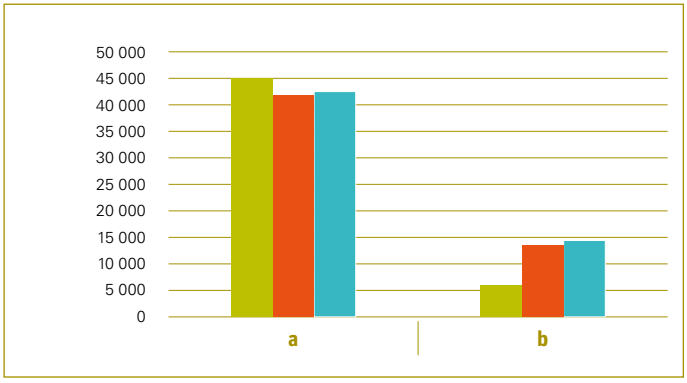
	2010	2011	**2012**
Compared with total number of visitors to the Museum	16,5	15,0	13,1
Compared with total number of visitors in groups	50,1	47,4	41,1

VISITORS WELCOMED BY THE EDUCATIONAL SERVICE

The Museum's commitment to expanding its educational activities off-site resulted in the continued increase in the number of outdoor visitors. These activities – XperiLAB.be science truck and BNEC – almost exclusively concerned groups and accounted for 28.1% of total group participants and 28.5% of total supervised visitors.

The number of participants at indoor activities rose 1.6%, while off-site activities rose 6.5%.

	2010	2011	**2012**
a Total number of visitors (on-site)	45 026	41 851	42 500
b Total number of visitors (off-site)	5 939	13 536	14 412



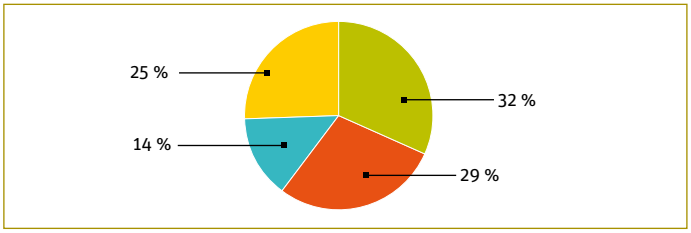
BREAKDOWN OF VISITORS PER ACTIVITY

Workshops and guided tours remained the most popular indoor activities, accounting for 61% of the total, but the overall number of participants at these activities was the lowest in recent years. However, very different developments underlie this statistic.

Indeed, the number of guided tour participants decreased. This reflects the fact that the temporary exhibitions in 2012 were less suited to this form of supervision. However, the number of participants at workshops achieved its highest level since 2004. In addition, the item Other activities for the public remained consistent, down by just 0.5%.

Off-site activities were up, those held in the XperiLAB.be science truck accounting for 73% of the total and reflecting the interest shown by schools in this type of activity. The figures for the BNEC for 2012 were also excellent.

	Nombre
Guided tours	18 054
Workshops	16 314
Other activities	8 132
Off-site activities	14 412
Total	**56 912**

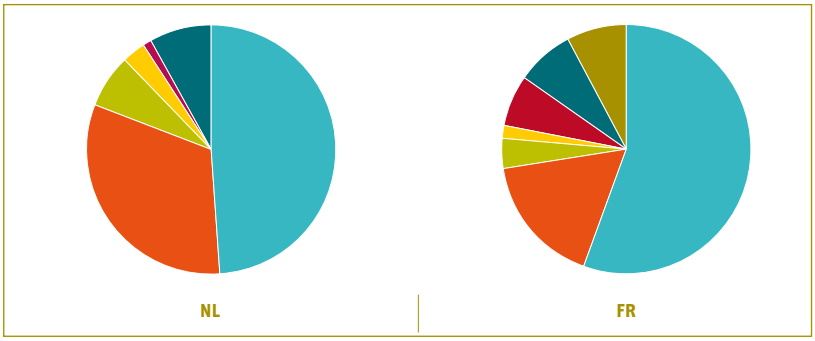


Overall, for 2012, the age of school visitors to the on-activities continued to decrease and, in parallel, there was a relative decrease in the participation of secondary school classes. For FR visitors, nursery and primary school classes accounted for 67% of all school visitors, while the figure was 57% for NL visitors.

This relative loss of a significant portion of our natural customers partly stems from the outside constraints faced by secondary schools. We are, however, banking on the content of future permanent galleries and future temporary exhibitions to get secondary school classes back to the Museum.

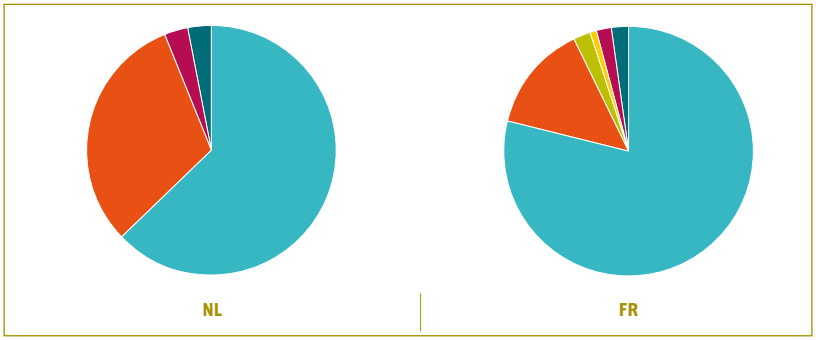
PROFILE OF PARTICIPANTS IN GUIDED TOURS (%)

	NL	FR
Nursery & primary school	49	59
Secondary school	32	18
Higher education	7	4
General education	3	2
Youth groups	1	7
Groups of adults	8	8
Individuals and families	0	2
Total	**100**	**100**



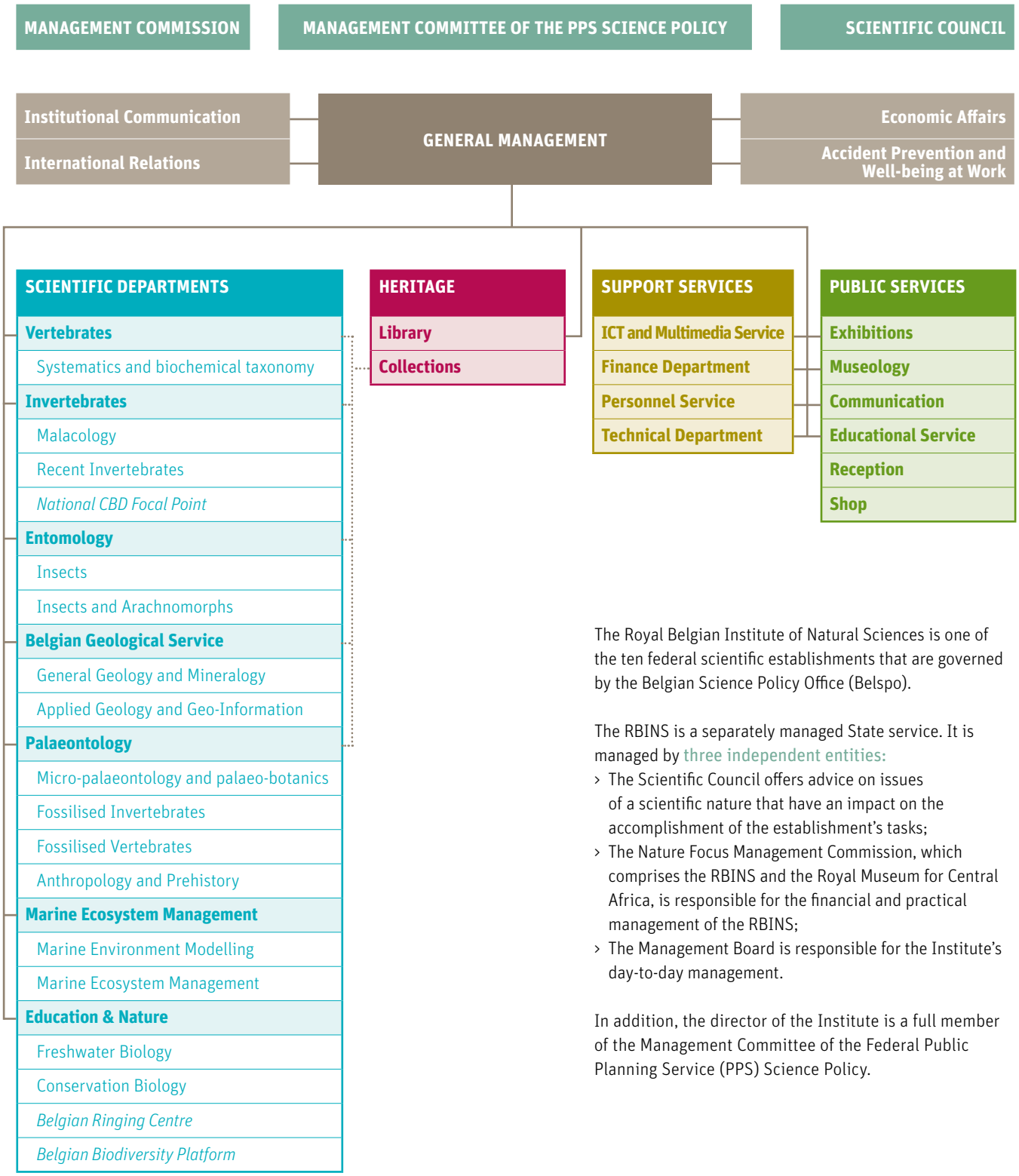
PROFILE OF PARTICIPANTS IN WORKSHOPS (%)

	NL	FR
Nursery & primary school	63	79
Secondary school	31	14
Higher education	0	2
General education	0	1
Youth groups	3	2
Groups of adults	3	2
Individuals and families	0	0
Total	**100**	**100**



THE RBINS IN BRIEF

Organisation



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 separately managed State service. It is managed by three independent entities:

- The Scientific Council offers advice on issues of a scientific nature that have an impact on the accomplishment of the establishment's tasks;
- The Nature Focus Management Commission, which comprises the RBINS and the Royal Museum for Central Africa, is responsible for the financial and practical management of the RBINS;
- The Management Board is responsible for the Institute's day-to-day management.

In addition, the director of the Institute is a full member of the Management Committee of the Federal Public Planning Service (PPS) Science Policy.

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.

Collections

With 37 million specimens conserved as Belgian heritage of universal significance, the RBINS's collections serve above all as reference and research tools.

Just behind London and Paris in the European classification, the collections in Brussels have been awarded the European label of 'major research infrastructure' and in this respect 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 digitise 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 taxonomical group.

Museum

For the general public, the Natural Sciences Museum is the visible part of the RBINS. It has 16 000 m² of permanent galleries, temporary exhibition rooms and educational workshops, 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, it being 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. It is pursuing its ambitious efforts to gradually renovate the premises, to make the Museum more convivial and increasingly better adapted to the expectations of society; it is also resolutely oriented towards the promotion of a more respectful approach to nature.

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All of RBINS activities are described in the
2012 detailed report (approximately 500 pages FR/NL).
This report is available on CD ROM
and can be obtained on request from
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