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Bicentenary of the Hungarian Natural History Museum

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The Hungarian Natural History Museum celebrates its 200th anniversary this year.

The Museum looks back upon these two hundred years as a history of ups and downs, but which did not prevent the museum from turning into one of the major Hungarian scientific institutions. With obsession and bias in the good sense of the word, the achievements of the scholars of geology, palaeontology, botany, zoology and anthropology, the five great fields of natural history, have always acclaimed recognition not only in Europe but worldwide. Well, in terms of the richness of collections (more than 10 million items) and 60 researchers' significant scientific achievements, ours can be compared to the leading European museums, with considerable success in many fields of research.

FOUNDATION OF THE MUSEUM

The foundation of the Museum goes back to 1802 when the Hungarian National Museum was established by Count FERENC SZÉCHÉNYI, who donated his 17,000-volume library, manuscript and coin collection to the nation.

In the same year, Countess JÚLIANNA FESTETICS, the founder's, FERENC SZÉCHÉNYI's wife donated the very first natural history collection that contained 'selected and valuable Hungarian minerals'. By 1810 the National Museum had grown out of this library, and in a matter of just a few years the collections got enriched to such a degree that the 'Camera Naturae et Artis Productorum' could be established.

The first palaeontology collection found its way to the Museum in 1811, and the first zoological one was purchased in the same year (butterflies, snails, clams). In 1818 Palatine JÓZSEF purchased PÁL KITAIBEL's (the 'Hungarian Linnaeus') herbarium, and laid the foundations for the Department of Botany. Later on, in the age of the rising Hungarian bourgeoisie, and in line with the patriotic feelings of

the reform period (the second quarter of the 19th century), thanks to donations and purchases, the collections started growing relatively fast.

The national library, the art, history, archaeology, and natural history collections were growing in number so rapidly that certain sections had to be moved more than once. In 1836, MIHÁLY POLLACK, the renowned architect of the time, whose buildings form an organic part of Budapest as we know it today, was commissioned with designing the building of the National Museum. The stately edifice of the National Museum was completed, and waiting to be occupied, in 1847. At this time, the mineral and rock collection counted as many as 13,000, the zoological collection more than 35,000 specimens.

1869 was the year when the first data regarding the number of visitors were preserved; nearly 65,000 visitors looked up the entire institution (with history and art collections included).

Owing to the diversity of the ever-expanding material, the Camera Naturae had to be made independent of the National Museum; this was the reason why independent zoological, mineralogical and palaeontological, and botanical departments came about in 1870. Thanks to independence, more and more specialists joined the departments and growth started gaining impetus. Since the upcoming chapters will elaborate on the scientific history of individual departments at a greater length, here and now we would just like to highlight some remarkable events and touch on just a few milestones further down the bumpy road.

Economic prosperity and unsuppressed national feelings in the last decades of the19th century further enhanced citizens' readiness to make donations as well as made high-scale collecting tours possible (Africa, Asia); nor should we lose sight of some remarkable state purchases that were made.. At the turn of the century the descriptions of materials LAJOS BÍRÓ had collected in New Guinea came out one after the other, proving that the interest researchers took in natural sciences reached far beyond the Carpathian Basin and even Eurasia. Back then the territory of Hungary was three times as big as today and much richer in natural resources. The country was making preparations for celebrating the Hungarian Conquest (the Magyars' arrival in the Carpathian Basin), large-scale construction work was in progress all over the country, the capital saw a monumental exhibition in the making, and some new museums were founded. Natural history collections included almost 1 million items at that time. The material of the Natural History Museum took a century to become one of the richest collections of Austria–Hungary, one of the leading European powers.

The crowdedness of collections, the lack of space made it imperative to move certain sections of the National Museum to a new location. Not unlike several other big national museums of the world, ours were also split up into specialised sections

Our collections remained within the confines of the National Museum for the time being. Botanical collections found their home in tenement flats in 1892, and then – in 1905 – in the building of the Hungarian Academy of Sciences. The Departments of Zoology, Mineralogy and Palaeontology were not moved from the National Museum, yet they hardly became any less packed. In 1902 the Department of Zoology alone comprised nearly 1 million items.

The National Natural History Museum gained only partial independence in 1933. Although, as a result of specialisation, independent departments were formed under the names of Department of Mineralogy and Petrology, and Department of Geology and Palaeontology, they still remained within the confines of the National Museum. The other departments were not as 'lucky' as them. In 1926 the Department of Zoology had indisputably outgrown the space that was available for it, so was packed up and provisionally moved over to a nearby building. Chaired by GÉZA HORVÁTH, the internationally known department head (who was honoured by, inter alia, Hungarian, French, Egyptian, Brazilian, Serbian, Bulgarian, Austrian, German, Czech, Russian, Finnish, Croatian, and Chilean state and scientific certificates of merit), the 10th Zoological World Conference was organised and crowned with enormous success in Budapest in 1927. Maybe that was the reason why the Department of Zoology could find its permanent location and become richer and richer in 1928 in Baross utca – in a building erected with other functions in mind to begin with. By the beginning of World War II the entomological collections counted as many as three million specimens.

In an effort to avoid war hazards, the valuable segments of the Department of Botany were fled – with the aim of safeguarding them – to the countryside in 1944–1945.

By misfortune, the better part of the collections got destroyed there, while the materials left in Budapest did not suffer so much damage. The Department has moved twice ever since, today it is occupying the ex-building of the Széchenyi Grammar School.

Right after World War II the Department of Anthropology was also founded, which moved into a onetime private villa in 1957.

After the Second World War, at the turn of the 1940s and 1950s, botanical and zoological research intensified again; commissioned by the museum, university and research institutes as well as private researchers got involved in these efforts, too. The research of domestic flora and fauna – thanks to our researchers' major contributions within the scope thereof, too – has gathered momentum in the past decades.

In 1956 our museum suffered maybe the heaviest blow of its history. On October 24 the building of the National Museum got shell-struck, and the famous Af-

rica exhibition, a portion of the Departments of Mineralogy and Palaeontology became devastated. And then, as if this ordeal had not been enough, on November 5 an incendiary bomb hit the Department of Zoology and 36,000 birds, 22,000 eggs, 13,000 fish, 40,000 amphibians and reptiles, 500,000 molluscs, 60,000 dragonflies and neuropterans, 200,000 flies, and 100,000 specialist books and offprints were destroyed.

In 1959, with the aim of replacing the burnt-out, famous Africa exhibition, ZSIGMOND SZÉCHENYI and his partners went for collecting tours to Africa. In certain parts of the world the museum of the relatively poor and small Hungary enjoyed a certain advantage compared to the much bigger museums of Western European countries. Since we were usually welcome as official guests in such 'exotic socialist countries' as North Korea, Vietnam, Cuba, and Mongolia, maybe our materials from North Korea and Mongolia are the richest of their kind worldwide. Beginning from the 1980s more and more countries in Asia, Africa, South America, Australia, and Oceania have become conceivable destinations for collecting trips.

And what comes next? Currently, the underground public area adjoining the exhibition hall, with a new exhibition space, and storage spaces sunk in the ground, is in the making. This will be followed by the completion of the former Ludovika Academy reconstruction, and then the time will come for palaeontology, botany, zoology collections, and the library to move in. As a result, these valuable collections will find their way to a safe and modern location. At the same time, the museum, which is operating in segregated sections for the time being, will have a fresh start in terms of operations.

THE BRIEF HISTORY AND COLLECTIONS OF DEPARTMENTS

Department of Mineralogy and Petrology

Even the previous chapters have made mention of the early history of the Department of Mineralogy and Petrology. In lack of subsidies allocated on a regular basis, a whole range of unique donated samples and entire collections, mainly with domestic ones in that number, evidently, involved the major source of enrichment. For example, Palatine JÓZSEF and Count PÉTER SZAPÁRY (1809) as well as Count JÓZSEF BRUNSWICK's wife donated substantial collections. Thanks to the contribution of the Hungarian Geological Society – that 'entwined' with the museum after the War of Independence in 1848–1849 – and the Royal Hungarian Natural History Society that turned over its collection in 1856, the collection became significantly richer.

According to the first consolidated catalogue, drafted in 1821, the collection of taxonomy included 4,376, topography 2,075, hard coal 400, and geognosy (petrography, actually) 243 items.

Although, by virtue of the Palatine's Decree, the collections of the museum became open to the public in as early as 1811, the first exhibition was not arranged before 1814, actually. Since the old museum building was demolished in 1838, the collections were packed in boxes and stored at the Ludovika Military Academy (Ludoviceum) until 1846. The mineralogy exhibition was re-opened in the new National Museum building in 1850.

The independence of the Department of Mineralogy and Palaeontology and the blessed activity of JÓZSEF KRENNER, an employee from 1866 and the head of the department from 1870 through 1919, the year of his retirement, marked the golden age of the mineralogy collection. Though KRENNER had exceptional qualities, the unprecedented progress the collection made during this time could not exclusively be attributed to his own personal merits. A better financial stance of the cultural portfolio generated by the stormy economic development of 'the palmy days of peace', also had a role to play. If it had not been for Mr KRENNER's close friendship with ANDOR SEMSEY, a landowner, who funded every area of the Department by an amount far exceeding state subsidies for nearly four decades, as of 1878, all the previously mentioned factors added up would not have been enough.

The acquisition of the 40,000-piece LOBKOWITZ collection in 1870 marked the start of an unprecedented enrichment that propelled the institution into the vanguard of European mineralogy. The collection – with the palaeontological material included – counted almost 120,000 items by the end of the period. The exhibition putting thousands of specimens on display was admittedly one of the world's most beautiful mineralogical spectacles.

The turn of the 1910s and 1920s saw the end of the unique constellation that had lead to the 'golden age'. The political and economic collapse of Hungary resulted in profound changes both in terms of the social and financial environment of the museum. Though the World War II hardly caused any harm to the Department, the fact that the whole country had bled out white and the iron curtain had been drawn brought about serious indirect consequences. Nevertheless, the real disaster occurred in 1956: the better part of the priceless collection fell prey to the flames Soviet tank shells ignited.

A considerable part of the warehouses and studies of the Department of Mineralogy and Petrology were completely destroyed, just like collection items, books and files. The two exhibition halls burnt out, too. As a result, the Department almost declined into its pre-KRENNER period state. After rescue work, rubble-

clearance, and reconstruction conducted until 1963 under the control of LÁSZLÓ TOKODY, the position of the department became stabilised by the mid–60s.

Eighty to 90% of 130,000 mineral and 8,000 stone samples were destroyed in 1956. Of 1,295 meteorites only 610 were saved. Hungarian citizens and foreigners attempted to make up for the losses by donations. Thanks to emergency budget funds, the remains of some old private collections (some 4,000 pieces) could be purchased. Despite modest financial possibilities, regular mineral purchases first made at and around Rudabánya, Gyöngyösoroszi and Recsk, and later on mineral exchanges continually increasing in number have greatly contributed to enriching the collection since the 1970s.

The new permanent exhibition after the fire was open from 1962 through 1988 in the building of the National Museum. The next big change in the life of the Department of Mineralogy and Petrology followed in 1995 when the Department, after 150 years, moved into the Ludoviceum again. At present, we give an inkling of the Carpathian Basin's most interesting minerals in the new exhibition hall.

The main body of the Department's collection is divided up into three main registered units.

Collection of Minerals

Not only its size but also its historical and educational significance make it by far the biggest collection. Approximately one third of nearly 54,000 inventory items come from the old collection. Specimens that have long been unobtainable and originate from classical sites stand out of the mainly Carpathian Basin-oriented collection. The facet precious opal samples of Vörösvágás (Červenica, Slovakia) add a special colour to the collection. As regards the material acquired after 1956, mention is to be made of magnificent minerals that originate from the ore deposits of Rudabánya and Gyöngyösoroszi, and the quarry of Erdőbénye Thanks, primarily, to the remains of the LOBKOWITZ collection that have come down to our time, there is a very nice, old material originating outside the Carpathian Basin, from deposits in Bohemia, Moravia, Germany, Austria, and Switzerland. The pre-1956, old collection also contains some glowing specimens from other parts of Europe and nearly every other corner of the world.

Department of Petrography

The Italian decorative stone collection donated by King VICTOR EMMANUEL II in the 1870s and comprising 400 brick-shaped patterns may be considered the most remarkable part of the 18,500-item collection.

Meteorite Collection

Mainly the remaining part of the old legendary collection makes up the more than 650-piece meteorite collection. By virtue of their size, the iron meteorites of Canon Diablo (287 kg), Lenartov (73.6 kg) and the Cape of Good Hope (66 kg), while owing to its beauty the stone meteorite of Divina stand out of the collection that includes several well-known pieces of remarkable size.

The Department staff pursue a very broad range of research work encompassing nearly the entire earth's crust, right from the surface down to the bottom of the crust, even covering the upper mantle that is located under the crust. Specialists with an interest in lithology tend to focus their research on the mineralogy and petrology of magmatites and sedimentary rocks as well as the lithology of altered rocks, lower crust, and upper mantle. The various branches of mineralogy involve soil mineralogy, topographic mineralogy and mineralography, and history of science. The outermost layer of the earth's crust is composed of soils generated from rocks. We assessed the role minerals generated in soils and inherited from rocks play in the generation of soils as well as their impact on rock characteristics. Mapping and familiarising with minerals occurring in Hungary involves a traditional field of research at the Department of Mineralogy and Petrology. Mineralography analyses the various characteristics of mineral species. From a geological point of view the Carpathian Basin is a young depression filled up with multi-kilometre thick sedimentary rock beds from glacial and Tertiary periods. Crude oil, natural gas, and thermal water exploratory drillings intersected the sedimentary beds and reached down as far as the basement right below them. The Department conducts intensive research aimed at clarifying the age and generation conditions of subsided, metamorphic rocks.

Department of Geology and Palaeontology

The collection based on the material donated by wife of FERENC SZÉCHÉNYI, JULIANNA FESTETICS, which presumably contained fossils as well, became later enriched by partly donated and partly purchased bigger or smaller collections. Of the donations, special mention should be made of Count PÁL SZAPÁRY's rich fossil collection (1809) and Archduke RAINER's collection that comprises glacial big mammals' bones of which he dispatched 'cartfuls' from the region of the river Tisza (1811). The 1821 'Catalogus Reinventationalis' features 777 petrifactions. Colonel JÁNOS GYURCSÁK's bequest (1834) throws some light on the diversity of collected items. It consisted of, among others, lapped precious stones, minerals, and fossils. Of the latter category the five well-preserved fish imprints he collected in the course of his military service at the world-famous Eocene deposit of Monte

Bolca, in the vicinity of Verona, are of outstanding value. Nearly half a century after its foundation, the Department counts already more than 5,000 fossils and even the number of large mammalian bones exceeds 100.

The rate of enrichment in the 1850s is even higher than ever before. These were the years when the palaeobotanical collection evolved as a result of GYULA KOVÁTS's, a plant-collector's, work. Count KÁROLY FORGÁCH donated a find of *Ichthyosaurus* he explored in Dorsetshire.

The 1860s are fairly productive as well. MIKSA HANTKEN's rich invertebrate collection originating from the Bakony Mountains and Germany, Duke JOSEPH LOBKOWITZ's magnificent palaeobotanical collection (several thousand items) coming from Bilin (Bohemia). Besides the ones mentioned hitherto some other highly spectacular acquisitions are to be pinpointed such as a primitive elephant's (*Deinotherium*) jaw from Transylvania, primitive mammals' bones from Sárkánykút, a primitive stag's horn from Dunaföldvár, and some excellent specimens collected by ISTVÁN TÜRR in Italy.

In 1870 the mineral, rock and fossil collections were merged into a self-standing department, the Department of Mineralogy and Palaeontology. Later on the collection showed a rapid and significant growth attributable to the synergy of three major factors: the far-reaching scientific and museology-related work of, even in international terms, eminent specialists (MIKSA HANTKEN, senior LAJOS LÓCZY, ÁGOSTON FRANZENAU), and ANDOR SEMSEY's extensive patronage, and state donations that were rendered on a regular basis (6,000 crowns in 1902). The size of the collection almost doubled before the turn of the century. Thanks to ANDOR SEMSEY's generosity, hundreds of valuable fossils enriched the collection. Items standing out of the collection: the enormous specimens of primitive crocodiles coming from Lower Jura, Holzmaden; *Ichthyosaurus* specimens with one of the most beautiful skin impressions among them; a 'bunch of sea lilies' (*Pentacrinus*) of unique size and beauty, a 2.3 m long *Teleosaurus*; the imprint of a large *Lepidotus*; small-sized flying lizards from the Upper Jura of Solnhofen mounted in a masterly manner; well-preserved primitive dragonflies, crabs, planktonic echinoderms; a car wheel-sized ammonite, the *Placenticeras*, revealed in a bed of Cretaceous period, in Dakota (USA); well-preserved fish imprints originating from the Eocene beds of Monte Bolca and Wyoming; a perfectly preserved sabre-tooth tiger (*Smilodon*) skull from the asphaltic lake near Los Angeles, *Glyptodon* shells from the Pleistocene of Patagonia.

Paradoxically enough, collecting gained another momentum after World War I, despite the fact that there arose fewer opportunities for that. This could primarily be attributed to the industrious staff of the Department who spent a remarkable part of their working time (several months a year) on collecting tours. Mining special-

ists' donations, however, also had a great share in enrichment. As a result, mainly the invertebrate material increased by several thousand items. This was the period when the native Eocene molluscs and gastropods of Gánt and the special fish fauna (with a specimen with enteric contents in that number) of 'Kiscelli Sea' (Eger and Óbuda) appeared in our museum.

A number of spectacular items, mainly big vertebrates, enriched the collection, too. In terms of evolution a kind of primitive elephant deserves special mention here: *Prodeinotherium hungaricum*, the remains of a *Deinotherium* and a *Mastodon*. However, the sandstone slabs of Ipolytarnóc (with one in the size of a smaller room among them) showing the well-preserved footprints of 11 kinds of Miocene vertebrates (elephantoids, rhino, predators, cervidae, birds, etc.). The 70 cm thick and 1.5 m long trunk of a primeval pine (with uniquely intact annual rings) also established itself at our Department. This ensemble of fossils involves an outstanding value of the collection.

World War II and the fire of 1956 could merely disrupt but not impair the dynamism of growth. The War caused a 20%, the fire of 1956 about an 80% loss (of the 140,000 inventory items 110,000 perished in fire!). Work was rapidly and intensely resumed after both disasters, and it took only a few years' hard work to regenerate, with irrecoverable losses excluded, the collection.

Alongside with materials mainly serving the needs of taxonomic and stratigraphic analyses, there appeared several outstanding finds in the collection. It is worthwhile highlighting here the skeleton of the Deinotherium of Pannonhalma, the *Mastodon* skull and tusk from Balatonszentgyörgy, and more than 150 Jurassic dinosaurs' (*Komlosaurus*) footprints hard coal mining surfaced at Pécs.

Currently, there are 90,000 inventory items kept at the Department.

The research of the biology and geological history of the Carpathian–Pannonian Region involves the scientific work of the Department. These research activities provide data for understanding the history of the biosphere and finding out more about the historical biology of the Hungarian soil.

Of the various classes of fossil we have, protozoans (Foraminifera), molluscs (bivalves, gastropods, cuttlefish), tentaculates (mantle-breathing bivalves, moss corals), and vertebrates (fish, birds, mammals) are significant in terms of number and value. Although we have fossils coming from the last half a billion years of the Earth's history, the collection focuses on the Mesozoic and Kainozoic periods. Our research work primarily revolves around the palaeontological, stratigraphic, and palaeogeographic analyses of Mesozoic materials, in addition to the ongoing scientific processing of significant Miocene gastropod and Pleistocene vertebrate ones.

Another method helps us outline palaeoenvironmental conditions and palaeogeographical changes. 'Today is the key to yesterday' – this is our guideline when analysing palaeoecology. In order to form an idea about their relatives' palaeoenvironment we must have as precise data as possible about the environmental needs of plants and animals of our time (e.g. ferns: humid, woodland environment, coral reefs: tropical, neritic zone).

The investigation of one-time living organisms' distribution plays a crucial role in palaeogeographical analyses. Investigations relating to the special historical events of the biosphere, mass extinctions, the annihilation of species are not less exciting either. One of the subsequent chapters discusses these investigations.

While development was fairly intensive up to the mid-1970s (remarkable enrichment of collections, a broad variety of subject matters, far-reaching scientific investigations, etc.), the scope of activities has somewhat narrowed ever since, with research becoming more focused for that matter. Thanks to the noteworthy boom in respect of science, museology, and the propagation of general knowledge, the Department of Geology and Palaeontology has become not only an internationally acknowledged workshop of palaeontology research but the centre of geological exhibitions and dissemination of general knowledge as well.

Department of Botany

As in the case of the other departments of the Natural History Museum, the Department of Botany underwent development within the confines of the National Museum. No sooner than in 1870, however, did it turn into a stand-alone Department, which made this year mark the actual birth of the Department of Botany. GYULA KOVÁTS was the first botanical guardian of the museum, and the first Hungarian palaeobotanist, who got appointed as the Head of the 'Department of Natural Phenomena' in 1850, i.e. at a time when departments were still combined. That is the reason why his name often sinks into oblivion and VIKTOR JANKA enters most people's mind as the first person becoming the guardian of the Department of Botany, or director in today's sense.

In that year there occurred an event enhancing the reputation of our museum in Europe; namely, the Hungarian Parliament voted for purchasing the Lobkowitz collection that was offered for sale, and thus had priority over the Royal Court in Vienna as well as several other states and tradesmen who also showed interest. This was the richest and most beautiful geological collection of Austria and Hungary.

Nearly every specimen of the collection is type or original, and even more than that, certain specimens are double types (Unger and Ettingshausen). Our 19th century original and type material in itself includes almost 600 items. Thanks to these specimens, our collection is regarded as one of the highest ranking ones in Europe. With 20th century types and originals added prominent specimens amount to more than 1,000. As a result of Palatine JOSEPH's generous purchase, the Hungarian LINNÉ's, PÁL KITAIBEL's herbarium was received in as early as 1810, thanks to which the Department became highly prestigious. The acquisition of the SADLER collection, and Archbishop HAYNALD's vast herbarium followed thereafter, and then DEGEN's invaluable herbarium and the university collection of 'EÖTVÖS LORÁND' University of Arts and Sciences (ELTE), that were acquired at the beginning and at the end of the 20th century, respectively, enriched the herbarium by leaps and bounds. Besides, nearly all the significant botanical collections of the country found their way to our Department of Botany by way of purchase or donation, so the sheet number of the phanerogamous herbarium has exceeded 135,000 by now.

Apart from the already mentioned palaeobotanic material, the phanerogamous herbarium is divided into two parts, a world material and one from the Carpathian Basin. As for the former, our collection of gymnosperms stands out with quite a few special species expeditions have collected from all over the world. We treat our lichen, moss, and fungus collections as separate ones in their own right because both their size and scientific value are imposing. A smaller collection is that of algae, mainly with sea algae among them, in a dried, herbarium-like state. In this latter respect JÓZSEF PANTOCSEK's siliceous alga collection is the finest.

A whole array of great personalities worked for the Department of Botany, such as, e.g., Baron GÁBOR ANDREÁNSZKY who, after researching plant geography, participating in collecting expeditions and working as a professor, devoted himself to palaeobotany only. By exploring and collecting Tertiary flora in Hungary he was the one who greatly enhanced the material of the palaeobotanical collection and his significant monographs involved a valuable contribution to domestic literature. SÁNDOR JÁVORKA worked for the Department of Botany from 1905 until his death, together with VERA CSAPODY, his loyal plant sketcher. There is hardly anyone who has not heard about their book Erdő-mező virágai (The Flowers of Woods and Meadows), but plant identification handbooks and their major piece of work, Iconographia Florae Hungaricae are also the products of these years. The latter enormous volume depicts the species of the Carpathian Basin through images and with a perfect accuracy and fidelity, which makes it indispensable even for today's research botanists who wish to investigate the species of the Carpathian Basin. VERA CSAPODY prepared more than 11,500 water-colours

of a number of plants, which also enrich the special collections of the Department of Botany.

All the other ongoing research work of the Department of Botany has its roots in historical values. Alongside with the investigation of one-time flora and vegetation – beginning from 190 million years ago – the research of present-day plants is partly associated with each taxonomic category and is partly environmental protection-oriented.

Should we roam about Transdanubia, we will find that the alginite hewers (oil shale) located in the vicinity of Sitke and Pula conceal the remains of a flora of 4–5 million years ago. Besides prevalent elm, oak, and *Zelkova, Gingko* and *Buxus* were also typical for the region.

Few would think that one of our richest materials dates back to Oligocene, 35 million years ago, and comes from under the territory of Budapest. One-time brick-yards of Óbuda (Old Buda) surfaced these fossils in a fairly good state.

The analysis of the interrelations and taxonomy of flowering plants that are indigenous in Hungary involves a field of research of plants living today. Over the past few years, two sorts of blood-wort (*Achillea*) have undergone a thorough genetic analysis. The genetic analysis of grasses has been in the centre of our research for years, just like the attempt made at isolating them by epidermis tests. The investigation of some simple genera, such as e.g. grape-hyacinth (*Muscari*) and *Sesleria*, is still in progress. Besides the ones in the herbarium, our research encompasses live plants as well.

The research of microscopic fungi goes back to a history of many a decade at the Natural History Museum. GUSZTÁV MOESZ, the renowned mycologist, created that ample and valuable collection that spread the reputation of the herbarium of microscopic fungi all over Europe. Unfortunately, the devastation of World War II caused irreplaceable losses to this collection. Following in the great predecessor's footsteps, the collecting and processing work of the past decades added a great number of valuable materials to the collection.

The Department of Botany is the centre of taxonomic and floristic research on macrofungi. Out of 3,000 macrofungi occurring in Hungary, the collection stores – dissected and lyophilised in a way unprecedented in Europe – 2,400 specimens. In the past 30 years the researchers of the Department have described 27 species new for science. Clarifying the current distribution of rare and endangered moss species in Hungary involves the major subject of research with regard to the moss collection. Within the scope of this research, the deposits of 49 mosses in the European Red Data Book of endangered species occurring in Hungary are being explored at present.

Department of Zoology

As witnessed by old inventories, the collection including even the first animals (mainly butterflies, gastropods, and molluscs) was purchased from Ms ANNA JORDÁN of Nagyszombat in 1811, not long after the establishment of the National Museum. We do not know too much about other early items, a good part of them became annihilated in the Big Flood of Pest, in 1838. Our oldest specimens can be found in TÓBIÁS KOY's butterfly collection from the late 1700s, which were purchased alongside with IMRE FRIVALDSZKY's material in 1864. IMRE FRIVALDSZKY and JÁNOS SALAMON PETÉNYI worked as guardians in the museum – we would call them scientic officers today –, who were engaged in enriching the collections by dividing zoology into two big areas, invertebrates (mainly hexapodans) and vertebrates. During the Hungarian War of Independence in 1849, the zoological collection including nearly 40,000 specimens took up eight halls in the building of the National Museum.

As various collections started outgrowing the confines of the National Museum and split, the independent Department of Zoology was established in 1870. The Department had a staff of seven by the end of the century and at the centenary, in 1902, the number of specimens preserved here reached one million. Though the majority of materials were the blossoms of individual collecting work conducted in the Carpathian Basin and the Mediterranean Region, the collection got enhanced with items originating from other continents through expeditions, collecting tours, donations and exchanges. Materials coming from busy hexapod traders of the time implied an outstanding contribution, and today these are the materials that constitute the most valuable historical segment of our collections. Praiseworthy is the expertise and skill in international relations by which 'administrators' of the time (collection managers) could track down and acquire these items.

The first half of the 20th century had researchers of the highest scientific standards working for the Department of Zoology. Just to quote the names of some world-famous researchers: LAJOS ABAFI-AIGNER (butterflies and moths), JENŐ DADAY (microscopic aquatic organisms), GÉZA HORVÁTH (true bugs), KÁLMÁN KERTÉSZ (flies), LAJOS MÉHELY (amphibians, reptiles), LAJOS SOÓS (snails). This is where ENDRE DUDICH worked in the 1920s, who later, as a university professor, raised an excellent generation of scientists, launching domestic fauna research at the same time. A number of ministerial investigations and reports stated how extremely cramped zoological collections were at this time. Zoological collections, working rooms, and laboratories were moved to 13 Baross utca, where they have been stored ever since.

Right before World War II the insect collection alone contained nearly three million specimens. Luckily, the war itself caused negligible damage to the zoological building and collections. However, all the more tragic were the consequences of the two fires the events of the 1956 revolution ignited, which devastated both the world-famous Africa exhibition of the National Museum, and the entire mollusc, fish, amphibian, bird materials, the better part of mammals; nor did it spare the fly collection, one of the top-ranking ones in its kind. For the compensation of incalculable damages donations flowed from all over the world, and very intense collecting work ensued. Beginning from the sixties the staff of the Department of Zoology had the opportunity of joining exotic collecting tours more and more often, and the 1970s marked the start of fauna exploration in Hungarian national parks.

Currently, the collection comprises more than 8 million specimens in all, mainly invertebrates in that number, 62,000 vertebrates, 30,000 microscopic slides, and approximately 170,000 vials of alcoholic material. The type specimens of about 85,000 species are kept in the Department of Zoology. However, it is not only the zoological material with a huge amount of data supporting it that lends value to the collection, but also the rate at which this material is processed, and the rate of data accessibility.

The Department of Zoology is split into collections preserving the material of bigger or smaller animal groups. Generally, the structure of collections corresponds to the animal world's structure but, in certain cases, there may be substantial discrepancies as well. For understandable reasons, we do not really have a remarkable marine animal collection, which can also be said about the specimens of certain other regions that are also underrepresented. Collections can be assigned to three major groups: three collections focus on the five classes of vertebrates (mammals, birds, fish-amphibians-reptiles), six ones on insects (Diptera, Lepidoptera, Hymenoptera, Coleoptera, Hemiptera, and smaller insect orders), and another five collections include other invertebrates (crustaceans and other aquatic invertebrates, Arachnoidea and other arthropods, molluscs, helminths and other invertebrates, and the parasitological collection). Thus we have 14 zoological collections altogether, of which the coleopteran collection is the biggest, counting 3 million specimens, and deservedly world-famous. Alongside with the beetle collection, the collections of Diptera (or flies), Lepidoptera, and Hymenoptera (bees, ants, wasps) also stand out with nearly or more than one million specimens each. As regards type specimens – whose importance has already been pointed out – the collection of Arachnida is of extremely high value, as is the case especially with the tiny, soil-dwelling acarids with 4,000 type specimens. Including the specimens of 1,200 mammalian species, ours accounts for one of the ten biggest and richest European collections of mammals. Owing to the collection-orientated nature of the

Department and, to some extent, to the traditions, above all faunistic and taxonomic research is conducted at the Department. The lack of a zoological institute, or animal ecology institute in Hungary imposes additional research tasks on the Department of Zoology, as the biggest Hungarian zoological institution.

We have published, and are publishing, the results of research of national parks. It was our researchers' staff that, often with international support, have converted the regions thus examined into some of the admittedly best-explored, and most thoroughly investigated geographical locations.

Partly the extended scope of expeditions we have made mention of earlier, partly identifications performed on the request of foreign museums have enabled us to have a share in exploring the animal world of other countries and continents (e.g. Eastern Asia, Africa, South America). However surprising it may sound, it is true that if it were not for several hundreds of proceedings the Department's 17 expeditions resulted in, or the material we preserve, it would be inconceivable to characterise Korea in zoological terms today. Taxonomic research activities involve an organic part of faunistic work because the description of the animal world of a specific region is, most of the time, closely related to the taxonomic analysis of bigger and smaller groups. With more than 170 volumes out so far, research projects of this kind lead to launching the series of identification handbooks Magyarország Állatvilága (Fauna Hungariae) in 1955. Animal ecology has always been researched at the Department of Zoology but the past few years have witnessed a hitherto unprecedented scale, as demands for domestic ecological research have increased (primarily generated by the protection of environment and nature). The subjects of research are very diverse, which is further coloured by the broad range of animal groups undergoing analyses. We study the ecological problems of various animals (above all birds, soil-dwelling beetles and Orthoptera) the impact of habitat borders and cultivation methods, and the issues of environmental ecology relating to certain endangered species.

Department of Anthropology

Built in the year 1847, the Hungarian National Museum already contained anthropological material, since 'the skull of a hero, presumably that of Vitéz BENE, who had his share in the glorious protection of Emperor BERENGAR I by Prince SOLT's side, in Italy of the early 10th century' found its way to the museum from MIKLÓS JANKOVICH's collection. The skull was explored at the village of Ladánybene, a place not far from Benepuszta.

In 1872, the ethnographical section seceding from the National Museum turned into an independent entity under the name of Ethnographic Museum. That is where, inter alia, the skull collection became located as well.

In 1881, when enlisting the tasks of the Department, AURÉL PONORI TÖRÖK, the first Hungarian anthropologist who was designated to the Department of Anthropology, the fifth of its kind in the world, dwelled on the importance of setting up an Anthropological Museum as well, 'so that anthropological research take as solid root in our country as possible'.

It was JÁNOS JANKÓ, ethnographer, the Director of the Ethnographic Museum of the period who established the collection of the Department of Anthropology in 1896 by urging the development of an independent collection within the confines of the museum. As he put it, 'collecting the fossils of peoples once living in the territory of our country, exploring the anthropological prehistory of our folk, and familiarising with the contemporary population of Hungary involve the task of the Laboratory'. These tasks apply even today.

JÁNOS JANKÓ's expedition taken in the region of Ob in 1898 produced a valuable collection of 29 Ostyak skulls, and SÁMUEL FENICHEL brought home 46 skulls from Papua New Guinea. PÁL BORNEMISSZA enriched the collection by 19 African, JÁNOS XÁNTUS by a Mexican Maya skull, and FÜLÖP BAK by 36 Egyptian mummies. These skulls are still preserved by the Department.

Thanks to the good relations of LAJOS BARTUCZ, the head of the anthropological collection, with archaeologists, the collection of human remains surfaced by excavations was started.

The acting director of the museum, ANDRÁS TASNÁDI KUBACSKA, in his submission of May 15, 1945 to the Royal Hungarian Ministry of Religious Affairs and Public Education, suggested that a Department of Anthropology be established as the fifth department of the Natural History Museum. 'Our objective with this is that the department dealing with Man should take its due place in the class of biological sciences'. He entrusted JÁNOS NEMESKÉRI, a schoolteacher, to run the Department. The submission was approved on June 8, 1945, which, in effect, meant that the Department of Anthropology became officially established.

The collections of the Department of Anthropology maintain the fossils of mankind's predecessors originating from Hungary as well as the bone remains of sometime historical populations living in the territory of Hungary. Processing of this rich and, in terms of space and time, representative material in a scientific manner and exhibiting the results involve our basic task.

The collection of fossils coming from the middle and late Stone Age

Bone remnants of international significance can also be found in the collection of the Department. From time to time, researchers of faraway countries will come with the mission of analysing fossils of outstanding importance. Revealed in Subalyuk Cave, in 1932, the bone remains of a 3–4 year old child and a 25–35 year old Neanderthal woman living in the middle Palaeolith, approximately 30–35,000 years ago, are also the pride of the Department.

The Hungarian representatives of *Homo sapiens neanderthalensis* lived mainly in caves and under the shelter of drip-rocks, they gathered in small groups but were not averse to taking up their abode in the open in the course of warmer months, either. Unlike this was the case in earlier periods, they would deliberately bury their dead. Cave Subalyuk is located at the edge of Cserépfalu (Borsod county). The remains of an adult woman and a small child came down to our time together with those of a fireplace and the bones of animals living in the neighbourhood.

The Department prides itself with cave finds from late Palaeolithic, as well (Istállóskő, Pálffy-barlang, Balla-barlang, Berva-völgy, Pilisszántó).

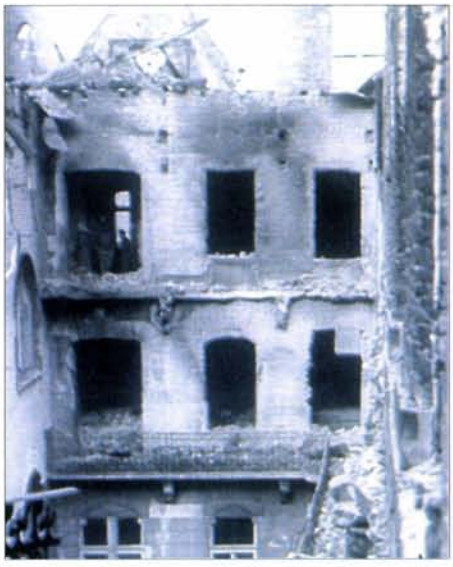
The collection of post-glacial populations

Although our collection, containing the remains of about 30,000 individuals, is remarkable also by virtue of its quantity, the fact that it covers a fairly long time-span is even more important than that. Especially the material of the migration period is ample; in this respect it is one of the richest collections of Europe. In terms of Hungarian prehistory, the authentic skull and skeleton remains coming from the time of the Hungarian Conquest and Árpád's reign are invaluable.

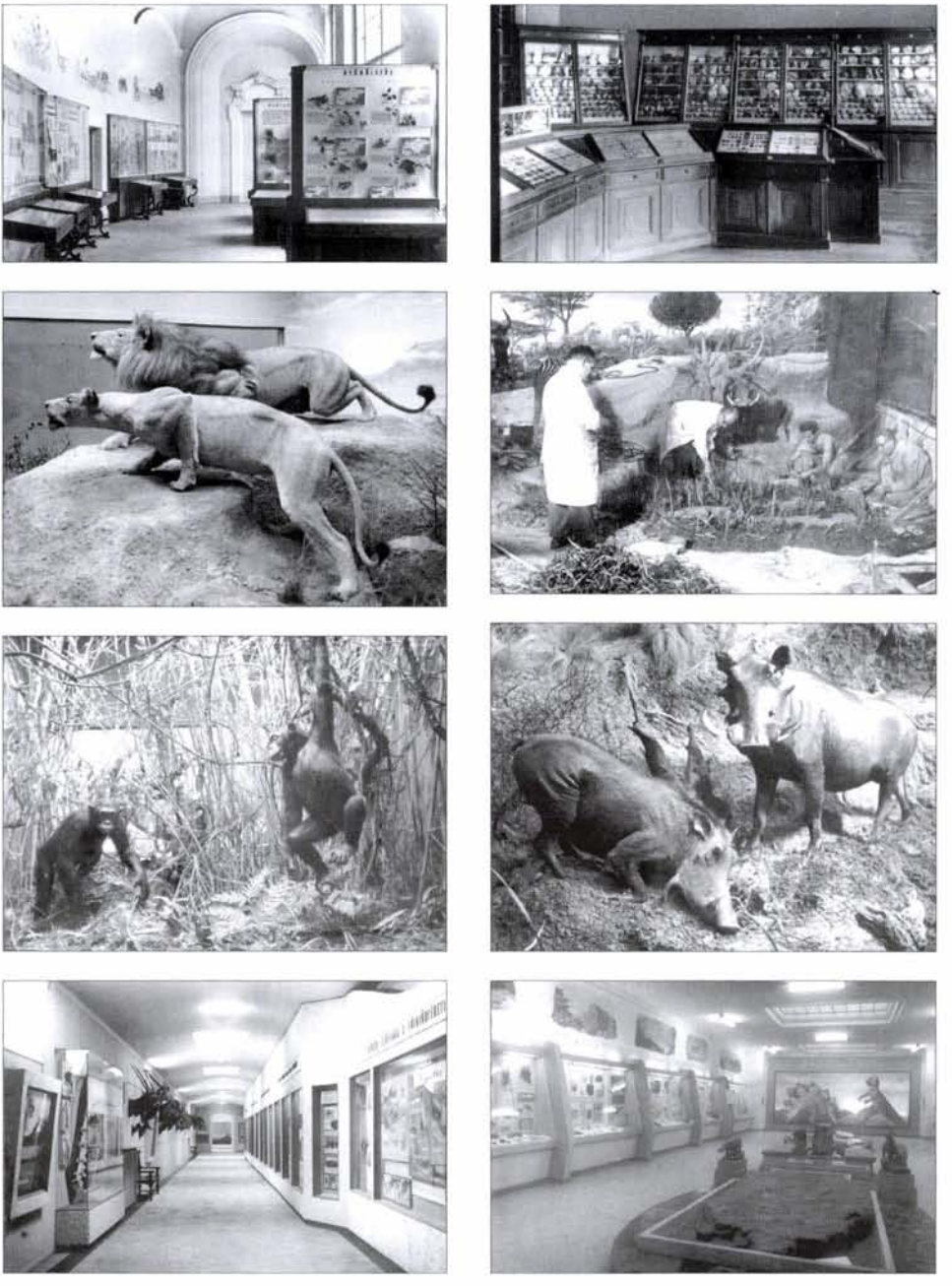
The collection of mummies of modern times

The more than 260 adults and children explored in the crypt of the White Monks' Church of Vác were buried between 1731 and 1838. When the crypt proved to be too small, some of the deceased were placed in the so-called ossarium, a wooden box. The remains of about 40 persons were revealed in such boxes. Thanks to fortunate climatic conditions most of the human remains became mummified spontaneously, without any external intervention.

Even the majority of coffins, attires, and burial textiles are preserved in good condition. The fact that available registers of death and coffin epigraphs throw light on the name, age and sex of the buried, and sometimes even the disease they suffered from, or causing their death, lends a unique character to the over 200 years



Top row, left: Specimens of the Koy collection are kept in their original, individual glass boxes. Top row, right: The zoological collection in the Hungarian National Museum, 1910. Middle row, left: The palaeontological exhibition around 1900. Middle row, right: The Department of Botany in the building of Hungarian Academy of Sciences (1905–1944). Bottom row: The ruins of the Department of Zoology in 1956.



Pictures of earlier exhibitions. Top row, left: Flora of Hungary (1953–1972). Top row, right: The systematic mineral and rock exhibition at the turn of the century (1902). Second and third rows and bottom row, left: The biota of Africa (1949–1956). Bottom, right: The evolution of the Earth and life (1961–1974).

old set of finds. There are data concerning family relations, too. The age of the dead varied between 0 and 94 years.

The collection of reconstructed faces

The Department of Anthropology includes about 50 skull-based plastic face reconstructions. The oldest one shows the features of our predecessor living 300,000 years ago. Reconstruction enlivens the man living the Carpathian Basin over the past 6,000 years.

Scientific research

Palaeopathological examinations have enabled us to learn more about the man of bygone days, not just about his diseases but his rate of nourishment, habits, and therapeutic activities.

Alongside with transformations caused by growth, ageing, sex, inheritance, and other biological processes, it is also possible to identify culture-induced traces on bones and teeth. For example, the artificial deformation of the skull and modification of teeth as well as non-intended, behaviour-induced transformations belong here. Our examination covers deformations wilfully induced during the burial service or other rite-related interventions, e.g. trepanation. Our examinations focusing on diseases reveal the time they were first diagnosed, the age when certain diagnoses manifested themselves as well as the changes they underwent through time.

Research of mummies of modern times

Anthropologists, pathologists, and experts in forensic medicine co-operate in the scientific examination of the mummified human remains explored in the Dominican Church at Vác.

Remains are being examined with absolute reverence to the deceased. Following cleaning and preservation activities we study the general condition and discolouration of corpses, determine their weight, and estimate their height and other body measurements. We are trying to find telltale traces in relation to the way of hair dressing and the pathological deformation of hair. Since the research is being conducted in the form of international co-operation, even the most up-to-date techniques, such as DNA tests, have been applied. Thanks to the said tests we have managed to detect the pathogens of tuberculosis on several persons' remains.

Library

When the Camera Naturae et Artis Productorum was established in 1810, it counted a few volumes only. It was FERENC SZÉCHÉNYI who donated these volumes.

The foundations of the specialised scientific library were laid down in 1870, with the formation of independent Departments.

Mainly donations enriched the holdings of specialised departments. In the course of its history the botanical books and journals bequeathed by Archbishop LAJOS HAYNALD (1891) involved the most ample contribution to the library. The acquisition of ÁRPÁD DEGEN's offprint collection and KÁROLY GOTTHARD's, the landowner of Herény, classical botanical book collection in 1938 further enhanced the value of the book stock.

World War II caused a considerable loss to both the book and journal stocks. Besides planned enrichment the library benefited from additional donations. The most remarkable among them was the collection of thousands and thousands of books and journals originating from the libraries of the Hungarian Adriatic Society and the Royal Hungarian Natural History Society after these two institutions had been terminated. Zoological and geographical volumes coming from nationalised church and noblemen's libraries also added to the stock.

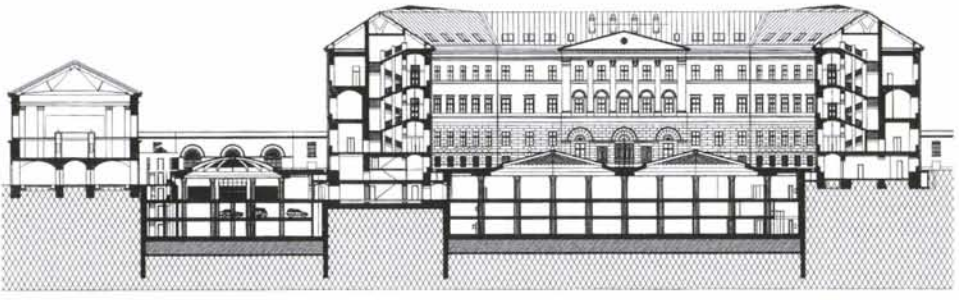
The fire of 1956 caused a severe trauma in the life of the library as well. Reference libraries of burned out collections were partly or – such as the extremely valuable libraries of the Department of Mineralogy and Petrology and the Department of Geology and Palaeontology – completely devastated. By losing its literature on ornithology and molluscs, and not to a lesser extent, the offprint collection of unparalleled value, the Department of Zoology suffered an irrecoverable loss. Seventy thousand volumes vanished altogether. Quite a few decades passed before at least the most important basic works could be procured again.

In the 1970s and 1980s the enrichment of the stock lost momentum and often, due to the lack of funds, became haphazard.

The successful bids of the past few years have triggered the build-up of the database of the holdings. Every new document has been processed electronically since 1991.

Exchanging publications with partner institutions involves another major source of enrichment. This exchange is based on publications museums have issued.

By its inherent nature, the library is a national research library. Within the scope of natural sciences it specialises in collecting mineralogical, palaeonto-



Top row, left: The Ludoviceum from bird's-eye view in the 1940s. Top row, right: The construction of new collection and working spaces developed in the loft. Middle row, left: Frontal view of the Ludoviceum, 2001. Middle row, right: The former Manège reconstructed to be a new Exhibition Hall. Bottom: Sketch plan of the new building complex.

The new building complex. Top: Orczy Garden with the ensemble of museum buildings, 2001. Middle and bottom rows: new storage facilities of the Mammal Collection.

logical, zoological, botanical and anthropological literature. Rendering assistance to research work is the primary function of the library.

Thanks to our predecessors' thorough and highly professional work, a stock of about 330,000 inventory units, the biggest collection of its kind in Hungary, has come about.

The Department of the History of Natural Sciences, established in 1945, and initially operating as a self-standing entity, is also part of the library. The documents of scientific correspondence and museum officials' professional practice that have been accrued since the establishment of the museum and its legal predecessors (1810) make up its material. Purchasing scientists' bequests and donations has also enriched the collection. By our days the collection has become rather heterogeneous: it includes personal letters, manuscripts, expert opinions, letters, catalogues, etc. Furthermore, the photo archives of the museum and a great number of our renowned scientists' material remains are also kept here. Hungarica manuscripts add a special value to the collection.

As a result of continuous enrichment the holdings today – according to estimates – contain more than half a million documents.

THE FUTURE: LUDOVICEUM AND ORCZY GARDEN

'The end of the millennium will see the new museum' – these were the optimistic words Endre Dudich, the zoology professor, put down to paper in 1939. The millennium he meant is over now. Though not completed as of yet, the construction work that has been going on for years now will eventually result in providing the Hungarian Natural History Museum with the opportunity of moving into. The turning point came in 1994 when the Hungarian government designated the ensemble of ex Military Academy (Ludoviceum) buildings and Orczy Garden, the garden surrounding it, as the future home for the Hungarian Natural History Museum. What kind of building is it – now it is certain – that will serve as a home for one of the biggest museums of the country in the 21st century, and maybe afterwards? The Ludoviceum, which was an officer training institution from the 19th century till the 1950s, is one of Hungary's 200 most significant architectural monuments. In the reform period, Palatine JÓZSEF commissioned MIHÁLY POLLACK, the country's leading architect, with designing this building; after the National Museum of Hungary this is his second most remarkable public building. The elegant, imposing classicist building was complemented with a two-storey covered Manège.

The reconstruction of the halls to make room for the Department of Mineralogy and Petrology was started and completed in 1995. That was when the reconstruction of the Manège of Ludoviceum (that burnt down in 1992) commenced with the aim of developing a permanent place for the exhibitions and the Educational Department. In 1996 our magnificent permanent exhibition of history and ecology 'Man and Nature in Hungary' was opened in this splendidly reconstructed building, and exhibitions have followed one after the other ever since.

In 1999, as a next construction stage, the brand-new loft of the big Ludoviceum was opened for the public, and the Department of Anthropology and three sections of the Department of Zoology, i.e. the collections of mammals and birds and the research group of Zooecology could occupy some of the most up-to-date museum premises of Europe.

We hope that a renewed ensemble of the Museum and Orczy Garden will serve the purposes of research, the dissemination of general knowledge, training, meaningful relaxation and recreation.