

# Chapter 2

## History of Dioramas

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### 1 Introduction

Dioramas in Natural History Museums are generally considered as the three-dimensional depictions of animal-landscape sceneries that include real or artificial models of animals in combination with background paintings and natural or artificial requisites. However, the meaning of the term “diorama” changed through time and is still not clearly defined and covers everything from miniature cardboard cases (such as Japanese Tatetanka paper dioramas) to the highly artistic installations in the world’s leading museums. Although Daguerre (1839) coined the name in 1822, the origin of illusionary presentations of landscapes or natural scenes roots deeper in history (Wonders 1993b) and may well have been invented independently more than once. The development of dioramas and related techniques in Europe was certainly influenced by the idea of “picturesque beauty” (Gilpin 1792), or by the philosophical idea of the “sublime and beautiful” (Burke 1757; Kant 1771), a new way of looking at landscapes with the eye of an artist by extracting and arranging beautiful and sublime components from the natural world and forming a piece of wonder.

Here we review the various technical innovations which led to the habitat dioramas which can be seen in many natural history museum of the world.

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## 2 Early Panoramas

At the turn of the eighteenth to the nineteenth century a new form of display, the panorama, was developed by a combination of art and technology in order to achieve a maximum effect of the illusionistic representation of landscapes. The term panorama was derived from the Greek “pan = everything” and “hórama = view”, meaning “to see everything”. Panoramas aimed to depict scenes or objects as accurately as possible by an application of optical principles such as tilted planes, curved painted backgrounds and modified scales of objects to reinforce the illusion through false perspective of a realistic view of a large scene in a compact space (Buddemeyer 1970). They depicted objects found in natural surroundings in the form of circular paintings or lengthy images which could be looked at from one central point. The Scotsman Robert Barker (1739–1806) and the German Johann Adam Breysig (1766–1831), are both considered as the inventors of the panorama. Barker painted a view of Edinburgh as the first panorama in 1787. He had this procedure patented as “panorama”. The breakthrough was an unusually large circular painting of London which was exhibited in a rotunda of 30 m in diameter, especially built for that purpose and completed in 1793. The motif on display was not a city view but the Russian fleet at Spithead, the main roadstead of the British fleet, which could be viewed from the deck of a frigate built in the middle of the rotunda. The success with the public was enormous. Twice a year the panoramic image was replaced by a new one, in order to keep the flow of visitors constant. Old paintings were afterwards sent to other cities and re-used.

In 1800 the cities of Paris and Berlin gained independence from London and opened their own panoramas. Paris did this under license, while, in Berlin, old and independently developed blueprints were used. Soon there were panoramas on display in all major cities of Europe. Particularly panoramas of battles were popular, but also historical or religious themes, often combined with interesting cityscapes and landscapes.

The prosperity of the panoramas led to developments with similar names. Due to the abundance of these “-oramas” and their complex history (reviewed by Oettermann 1980) we mention just a few examples.

**Neorama:** Most closely related to the panorama. On a circular painting the interior of a building was depicted including people and changing illumination. Developed by the Frenchman Pierre Alaux (1783–1858), who exhibited the first one in Paris in 1827, which showed the interior of St. Peter’s in Rome. One to two years later an interior view of Westminster Abbey in London followed which however was not successful, probably due to a lack of artistic skills of Alaux, and no more paintings followed (Oettermann 1980).

**Myriorama:** A kind of strip panorama. It is a laying game consisting of a painted landscape with an infinite horizon line cut into compatible playing cards. Each margin suits to another one so that the individual pieces of the scenery can be combined to form various landscapes. It was invented in 1802 by Jean-Pierre Brès (1760–1834) in Paris and subsequently improved by John Heaviside Clark (1771–1863) in

London. Though originally intended to compete with the panorama at a large scale, it turned out to be more profitable when scaled down and marketed as children's entertainment through the book trade (Oettermann 1980). As a laying game the myriorama has survived until today.

**Cosmorama:** Also called room panorama, cosmoramas were a kind of small panoramas. Usually they measured  $6 \times 1.20$  m, showing mostly topographical views on paper painted in watercolors. They were constructed in a semicircle, built into a box and viewed through optical glasses to let them appear life-sized and with more plasticity and spatial depth. Six to eight glasses of up to 12 cm in diameter were installed in the front wall of the box, which was built at a distance of 1 m from picture plane. Cosmoramas were mostly illuminated by daylight and allowed more varied performances. They soon attained equal footing with the exhibition of large panoramas and became more and more popular, especially in the first half of the nineteenth century (Oettermann 1980).

**Georama:** A gigantic hollow globe construction with continents, oceans, rivers, mountains etc. displayed on its inner surface, so that the public could wander around within the globe and look at the side-inverted displays. The first georama by Mr. Delangard (life data unknown) opened in 1826 in Paris. However, it was really successful only after the expansion and development by James Wyld (1812–1887) in London. Wyld's Great Globe was exhibited there from 1851 to 1862. The building consisted of a huge hollow sphere of about 12.2 m diameter and the inside was provided with four stacked galleries for the visitors. On its inside the surface of the earth was formed true to scale with a three-fold super-elevation (Oettermann 1980).

**Length panorama (moving panorama):** The most consequential variation of the panorama was probably the length panorama. Here the panoramic view of  $360^\circ$  was replaced by the depiction of landscapes on long canvas, causing an illusion as one would look out of a window of a train or from the deck of a ship. The canvas was wound up from one cylinder to another. Often the canvas length was up to 10 m, on which an equivalent of 30 km or more of landscape were depicted. The date when the moving panorama first arose can not be determined with certainty. Since the 1820s this kind of exhibition enjoyed more and more popularity, especially in English speaking countries. Moving panoramas were an essential part of stage equipment in the drama theatre of the nineteenth century (Oettermann 1980).

**Pleorama:** A kind of moving double length panorama. Architect Carl Ferdinand Langhans (1781–1869) and writer and artist August Kopisch (1799–1853) opened the first one in Breslau in 1831. In this exhibition the audience sat in a boat floating in a pool of water between two large, parallel-running length panoramas, which, while passing, enhanced the illusion of a boat trip in the Bay of Naples. Probably due to its complicated equipment and the great technical effort, the pleorama found no subsequent imitators (Oettermann 1980).

Nowadays all these names are no longer in use and only the word "diorama" survived. However, new digital techniques combined with robotic cameras just led to a new and exiting form of panorama, the "GigaPan" (<http://www.gigapan.com>).

### 3 Dioramas in the Original Sense

The diorama was originally focused on the representation of movements, because their absence in panoramas was felt as a deficiency. The new method was introduced to the Parisian public in 1822 by Louis Jacques Mandé Daguerre (1789–1851) and Charles-Marie Bouton (1781–1853). Daguerre was a stage painter specialised in lighting effects and very famous for his sunrises and sunsets, while later on he played an important role in the development of photography.

The first dioramas were 22 × 14 m large paintings which were painted opaque or translucent on transparent canvas. The light came from the front or back of the canvas and was regulated by different colored apertures—therefore, the patented name diorama = translucent image. The audience was sitting in a dark room. The lighting effects could range from moonlight to sunlight with wafts of mist, moving clouds, sparkling waterfalls, oncoming and unleashing thunderstorms etc. During the presentations, there was rarely a moment in which nothing moved or altered. The lights merged continuously, and with the changing light intensity the colours also changed, regulated by the different apertures. That kind of motion in a picture was the overwhelming novelty at that time (Verwiebe 1997). The diorama quickly spread from Paris to the capitals of Europe. Daguerre kept his special painting techniques of translucent images as a secret, so all other dioramas were dependent on the paintings of Daguerre and Bouton. After being shown in Paris, the dioramas went on tour.

In a time of economic downturn new attractions had to be found. Bouton had emigrated to London, and, in 1832, Daguerre presented a view of the valley of Chamonix with the Mont Blanc in the background and a complete Swiss chalet with all the associated devices in front. Real trees, scattered devices and a live goat feeding on hay from a manger completed the scenery. During the presentation alphorns resounded and a choir sang Swiss folk songs. Daguerre painted over the real objects to make them even more attuned to the image, whereby the boundary between reality and illusion actually disappeared in the eyes of the observer. This manner of representation, however, apparently did not meet the taste of the paying public sufficiently so that Daguerre largely renounced on real objects afterwards and developed his diorama to a double effect diorama. A picture was painted on the front of the especially prepared canvas, and another variant of the same motif, usually the night effect, was painted on the back. This resulted in a presentation of several images on one single surface by the use of different levels of brightness such as dawn, bright noon and dusk, passing even into full moonlight scenery.

Daguerre succeeded best in 1834 with the representation of a midnight mass in the church of Saint-Etienne-du-Mond, which he could put on display for three years continuously. At the beginning the Church was in full daylight, which decreased slowly and finally gave way to the night. As the light faded outside, more and more candles lit up in the Church and the benches were filled with worshippers, with the sounding of an organ as a highlight. A new quality of representation was achieved.

With Daguerre's diorama destroyed by a fire in 1839, the history of his invention ended. Attempts of revival brought no significant innovations. The panorama, however, experienced a new boom between 1880 and 1900. The panorama "Battle of Sedan" in Berlin was opened in 1883 in the presence of the emperor. Here, the precise documentation of a historical moment was more important than the creation of an illusion. Reminiscence and envision of a glorious historical moment was the main interest. The panorama was supplemented by three dioramas, which were also in the service of the documentation, but had lost the clever achievements of Daguerre, like changing lighting effects. Only a static top light and the darkened auditorium remained (Oettermann 1980).

## 4 Precursors of Habitat Dioramas in Natural History Museums

The ideas and techniques of the dioramas were soon adopted by the Natural History Museums of Europe and North America. The terminology for diorama-like objects or installations is still inconsistent, both in the literature and in public use. In the following we concentrate on the development of dioramas in Natural History Museums because this is where they prospered until today.

### 4.1 *Artificial Groups*

Artificial or mixed groups show an unnatural large number and diversity of individuals and species in a particular landscape. All animals may occur in this landscape without biological context, the fox peacefully next to a rabbit. Cabinets of curiosities were already common in the Renaissance. Shells, fossils, skulls and stuffed or fluid-preserved animals were arranged in cases following no obvious order. Wonders (2003b, p. 425) figured an example from a Swedish natural history cabinet of 1804, where 169 stuffed birds from around the world were arranged, apparently by taxon group, in a huge wall case. Such showcases with artificial groups persisted in museums until recently. The old galleries of the National Museum of Natural History in Paris, first opened in 1889, were famous examples of the same principle (Berenger and Butor 1994). A further development was the installation of a painted background, and sometimes terrace-like or pyramid-like structures in the cabinets which allowed arranging many large and smaller animals in a given space. Some of the early "dioramas" by G. von Koch in the Darmstadt Museum (Koch 1910) are of this type, and were found also in the Natural History Museum in Hamburg (Köstering 2003, Fig. 32) and many others.

## 4.2 *Geographical Groups*

A way of displaying animals or plants from a specific geographical region (Africa, Asia, etc.), or from a specific environment (tundra, desert, etc.) were the geographical groups. Background painting and foreground requisites were not required but often added, but no attempts were made to create an illusion of reality. Examples of this type of presentation were (or are) found in the museums of Darmstadt (Feustel 1968), Tervuren, and many others. Their purpose was more education than illusion. Voss and Sarkars (2003) argued that the early geographical groups performed in Darmstadt by G. von Koch were stimulated by the book “Geographical Distribution of Animals” of Wallace (1876), and that his book was influential to the further development of dioramas.

## 4.3 *Biological Groups*

Biological groups are often called dioramas, but they lack the curved painted background and the illusion of space, and often also any protection by cases and glass. They showed a piece of nature with a natural combination of habitat, plants, and animals, as if taken from the wild. The principle was already shown by Albrecht Dürer in his famous water colour, “Das große Rasenstück” (large greensward) of 1503, in which he painted a small piece of meadow with all its details. Biological groups can be “little landscapes” (Insely 2008) but also large open installations, such as the (lost) group “Wolves and moose” by August Sander of 1901 (Köstering 2003, Fig. 30), the group “Animal life in the Arctic” of 1907 in the Berlin Museum (Kretschmann 2006, p. 278), or the new African savanna of 2003 in the Museum Koenig, Bonn. A critical condition is that these groups reflect the biology and ecology of the species shown (e.g., a flock of birds feeding on berries; a pack of wolves chasing a moose; a family of foxes in front of the burrow), and not just the phantasy of the taxidermist.

A famous example of biological groups are the bird groups of Bengt Berg (1885–1967) in Bonn, a Swedish preparator and writer who worked for the Museum Koenig from 1909 to 1913 (Berg 1926; Bechtle 1978). For his biological groups he collected substrate, plants, rocks, birds and their nest and eggs from the original nest site, mostly in Scandinavia, and combined everything in Bonn into a few square meters to show the bird’s habitat. These bird groups were originally shown in daylight in separate show cases which could be examined from all sides. Around 1960 they were moved into a new gallery with dimmed light, furnished with curved painted backgrounds and artificial illumination, and thus turned into real habitat dioramas. In 2000, these were dismantled during a renovation of the building; some were renovated and transferred into new showcases, and thus were made biological groups again.

Small and large biological groups are common in museums around the world and have a long tradition, particularly in the British Islands (Morris 2003, 2010),



**Fig. 2.1** Example of an early bird case dating from 1793 (Museum Koenig, Bonn), composed of a stuffed *Turdus pilaris*, real plants, and artificial leaves and flowers. (Photo R. Hutterer)

Germany (Köstering 2003), Eastern Europe (Hutterer and Elzen 2007), and North America (Quinn 2006) Fig. 2.1 shows an early example made in 1793, but the poet Johann Wolfgang Goethe kept an even older case (c. 1776) in his collection, a kingfisher in a glass-covered box amidst a naturalistic foreground and a painted background (figured in Wonders 1993b).

## 5 Habitat Dioramas

Habitat dioramas are the result of a development of fine biological groups into “windows on nature”, as Quinn (2006) called them. Well-made habitat dioramas are perfect combinations of the “sublime and beautiful” with scientific accuracy, art, and technology. Necessary requisites of habitat dioramas are a domed back wall with naturalistic background painting and effective illumination, perfectly merging into the foreground and its real components like animals, plants, rocks, water, and so forth. A clever use of perspective and foreshortening in the background painting increases the impression of a large space or open landscape. The diorama can be viewed from one side through a large “window”. The viewer rests either in a dark area (for example, Staatliches Naturhistorisches Museum in Braunschweig, Fig. 2.3), or in a bright hall (American Museum of Natural History, New York). Some dioramas are window dioramas where the viewer looks over an opaque barrier, higher than floor level, into the diorama, as in the new backyard diorama at the Natural History Museum of Los Angeles County. There are also waist-high window dioramas, exemplified by some of the dioramas in the Museum für Naturkunde, Berlin, which reduce the breadth of the depicted scene in order to focus on a limited



number of specimens and their immediate environment. After Reiss and Tunnicliffe (2011) dioramas can also be classified according to their mode of representation of the specimens, which can be two- or three-dimensional and, in the case of animals, static or moving. Animatronics are examples of three-dimensional specimens with the capacity for movement, while two-dimensional versions of the specimens are shown through technologies such as video projection (e.g. the elephants walking on the background of the Somali arid zone diorama in the recently renovated African Hall of the California Academy of Sciences), or even holograms.

A habitat diorama usually has a message, either directly or indirectly. One general message is to provoke wonder and emotion about nature, sometimes even fear (Quinn 2006). A further (unspoken) message is to increase awareness about nature conservation. Particularly in the United States specific dioramas have had an important impact on decisions about the creation of nature reserves. The Pelican Island diorama in the American Museum of Natural History, when first displayed in 1902, assisted in the creation of the first Federal bird reserve in 1903 (Quinn 2006).

Karen Wonders laid the foundation to a scientific study of habitat dioramas and discussed their possible origin and evolution (Wonders 1993a, b, c, 2003). She argued that the long history of bird taxonomy (Schulze-Hagen et al. 2003) has driven the development of the habitat diorama, as only the invention of new techniques for the permanent preservation of birds allowed a further development of more sophisticated displays. Bird relief pictures fabricated in Silesia (today in Poland) in the early nineteenth century seem to support this view, as they met all criteria for a habitat diorama and thus represented an important step in the development of early bird taxidermy to the highly sophisticated art of habitat dioramas in the twentieth century (Hutterer and Elzen 2007). In the same region small city dioramas had a long tradition (Glanz 2005). Also bird cases with background painting and sometimes furnished with artificial or natural requisites (Hevers 2008; Morris 2010) can be regarded as an early form of habitat diorama.

## 6 Examples

### 6.1 *Europe*

The first European museums which adopted a naturalistic approach to zoological exhibits were the so-called biological museums in Sweden. In these privately founded museums animals were integrated into visual representations. Biological museums were invented by Gustaf Kolthoff (1845–1913), a Swedish hunter, naturalist and taxidermist. He developed an exhibition concept that associated public education with entertainment by illusion. According to Kolthoff, the visitor had the complete picture in front of him in a biological museum, and could therefore see immediately what words can not describe. His habitat dioramas were mixed groups. Three largely preserved original dioramas by Gustaf Kolthoff and his son





**Fig. 2.2** Detail of the diorama “In the outer archipelago” in the Biological Museum in Turku, Finland, which was set up by Gustav Kolthoff and his son Kjell until 1907. It belongs to the first series of dioramas in Europe, developed by Kolthoff in Sweden. (Photo J. Hevers)

Kjell in Turku were called “In the outer archipelago”, “In the inner archipelago” and “Mountain landscape of Lapland”, each of them depicted numerous species of animals (Puhakka et al. 1996) (Fig. 2.2).

The first private biological museums, which no longer exist today, were built by Kolthoff in Källeviken (1875), Kalmar (1882) and Uppsala (1889). Some of his work has outlasted until today, for example the biological museums in Stockholm (1893), Åbo, the Finnish city of Turku (1907), Uppsala (1910) and Södertälje (1913). Kolthoff’s exhibition concept was improved by Olof Gylling (1870–1929), who also was a naturalist and taxidermist. His dioramas can still be seen in Gothenburg.

Only a few dioramas existed in Germany at the beginning of the twentieth Century. They presented a kind of supplementary addition to the exhibitions and were not seen as a fundamental alternative of the traditional way of making exhibitions. Following Darmstadt in 1904, some other European museums built habitat dioramas: Paris 1906, Berlin 1907, Frankfurt 1907 (Becker 1997), Kent 1908, Leipzig 1908 (Becker 2004), Bucarest 1908 (Pinna 2011), Amsterdam 1926, and Bonn 1912–1933 (Bechtle 1978). More recent examples are known from Milan (Alessandrello et al. 2011) and Helsinki (Granqvist 2012), but a full inventory of dioramas in European museums has not yet been made.

Hunting played a pivotal role in the development of taxidermy techniques and the use of habitat dioramas. This was obviously caused by the personal interests of private museum founders—a clear parallel to the Swedish model. Major Percy



**Fig. 2.3** Habitat diorama from 1977 showing a male and female roe deer in summer in a grain-field at the foot of the Elm hills, Germany. The reaped crop strip draws the eye into the distance and nicely merges with the painted background. (Photo Staatliches Naturhistorisches Museum, Braunschweig)

Horace Gordon Powell-Cotton (1866–1940) in England, Louis-Philippe-Robert, Duke of Orléans (1869–1926), in Paris and Alexander Koenig (1858–1940) in Bonn presented the results of their game hunting in this way. The hunter and taxidermist Rowland Ward (1848–1912) was specialized in the mounting of big game trophies collected in Africa by the European nobility. He established a business in London in 1872 that became the largest and most famous taxidermy firm in the world. The majority of the trophies of Major Percy Horace Gordon Powell-Cotton or of Louis-Philippe-Robert, Duke of Orléans were prepared and mounted by Rowland Ward in his taxidermic studio in London. Ward was always up-to-date on the latest display methods and played an important role in the development of habitat dioramas in Europe, although he was more interested in displaying an entertaining spectacle than in objective re-creation of nature. Many of the species he mounted were purchased by the British Museum (now the Natural History Museum, London). Ward even established a fund in his name at the museum for purchase of specimens (Wonders 1993a). From 1951 to 1960, the remaining funds were used to create the Rowland Ward pavillion, which consisted of three dioramas of African mammals, dismantled in 2004 (Morris 2010; Reiss and Tunnicliffe 2011).

The trend towards big game dioramas was limited in continental Europe. An exception was the museum of Bern in Switzerland. The Natural History Museum had 228 dioramas with a total of 882 specimens (Huber 1982), of which 41 showed African animals. The dioramas were created between 1934 and 1936. Many mammals shown in these dioramas originated from a hunting expedition by Bernhard von Wattenwyl (1877–1924) in 1923/1924. He shot the animals for the museum

Natural History Dioramas

History, Construction and Educational Role

Tunncliffe, S.D.; Scheersoi, A. (Eds.)

2015, X, 289 p. 50 illus., Hardcover

ISBN: 978-94-017-9495-4