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The ornithology of the Baudin expedition (1800-1804)

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Chapter 1

Putting the Baudin expedition (1800-1804) into its historical and ornithological context

On Sunday, 19 October 1800, two ships sailed from Le Havre harbour bound for the faraway coasts of New Holland (Nouvelle Hollande or Terres australes in French) or Australia. The expedition was commanded by Nicolas-Thomas Baudin (1754-1803) and was the first expedition that was given specific instructions to collect and record natural history items as one of its main objectives. The majority of the exploration voyages undertaken between the 15th and 19th centuries were focussed almost exclusively on the search for and transport of raw materials and resources for trade and establishing trading and supply posts. Only scattered notes of the wildlife the travellers encountered have survived. The exotic specimens which these early explorers found were sometimes brought back to Europe alive, if the animals survived the hardships of sea travel and unskilled care. More often they were dead, having expired on the return journey or having been shot for collecting in the first place. These specimens went on to form private menageries or collections of rare and wonderful curiosa from far-flung parts of the globe and were primarily regarded as objects of beauty or novelty and status symbols for their wealthy owners.

The objectives of the Baudin expedition would now be regarded as 'scientific', although the term and working methods had not yet been defined as we understand it today.[1] The expedition can be viewed as a turning point in the exploration of natural history on a global scale, as it collected specimens from all the natural history groups it encountered, did not specialise in one particular field and also brought back large numbers of specimens. This Baudin expedition was also one of the first to be instructed by a national institution, in this case the Muséum national d'histoire naturelle, Paris, France (hereafter MNHN), to collect large numbers of samples which would then be made available for naturalists to study. Today this latter aspect is considered self-evident, but at that time only the rich or the learned had access to these kinds of exhibits. This chapter will discuss the development of collections and the history of ornithology in Europe until the Baudin expedition's departure for New Holland.

Fig. 1-001 | LANDSCAPE WITH BIRDS painted by Roelandt Savery in 1628 (© *Kunsthistorisches Museum, Vienna*).

THE DEVELOPMENT OF ORNITHOLOGICAL COLLECTIONS

Collecting the specimens

Prior to the Baudin expedition, ornithological collections served primarily aesthetic purposes, forming an artistic display usually in a private setting. The owners of these collections were wealthy traders and members of the aristocracy,[2] with the Royal collections often being one of the sights of the city. The collections were almost all privately owned and were not subject to state interference. Menageries and zoos had already been a part of European culture for a very long time. The first lions, elephants and camels, for example, were brought to Amsterdam by the end of the 16th century (Engel 1986: 6). The multinational company Vereenigde Oostindische Compagnie (VOC) even had its own stables for exotic animals (Witkamp 1872, 1875).[3 4] Most of the exhibits of birds in these early collections and cabinets of natural history showed their skeletons, eggs, feathers, dried wings, feet, beaks or heads. Mounted birds could only be preserved temporarily due to the restricted and unreliable preservation methods available. The collections themselves were also used extensively for illustrating natural history books and as models for exotic birds included in paintings (Schulze-Hagen *et al.* 2003).[5]

The 17th century heralded in a more intensive period of bird collecting, as many specimens were brought back from distant places by the Dutch ships that sailed for the VOC (1600-1802), the West Indische Compagnie (WIC) (1621-1792) and the English Honourable East India Company (HEIC) (1600-1874). Birds were bought, collected, exchanged and transported mainly for commercial purposes. There were both government organised (see table 1-001) and privately funded expeditions (see table 1-002) which were specifically instructed to collect natural history items and other curiosa for their owner's personal interest. Military campaigns were also often instrumental in providing natural history specimens prior to 1800, the most well known of which is the French campaign in Egypt and Syria led by Napoléon I (1769-1821) between 1798-1801.[6] These expeditions brought back numerous new species, either as written descriptions and drawings, preserved in spirits, as a skeleton, 'study-skin' or as mounted specimens. Some were subsequently described as being 'new to science' and a number of them are still available today. Unfortunately, the preservation of specimens was a huge problem: most specimens collected before 1800 have vanished due to neglect and decay and only a limited number (1,500-3,000) still survived in 2005 (Steinheimer 2005a). A quick comparison of the specimens brought back by six collectors shows that of the 1,838 specimens that entered the MNHN prior to 1800, only 211 survive today (11,5 %) (Jansen 2015a).

Private individuals, such as Joseph Banks (1743-1820), played a key role in the exploration of the natural world, especially in extending the knowledge of Australian ornithology. Banks joined commander James Cook on Cook's first expedition that explored the uncharted lands of the South Pacific. During the voyage Banks collected large numbers of plant and animal specimens. He also received a fair share of the specimens collected on all three Cook voyages and subsequent donations from other visitors to Australia (chapter 3.7) (Jansen & Roe 2015).[7] Via Banks they became spread amongst collections (Stresemann 1949, 1950, Whitehead 1969, 1978, Medway 1976, 1979, 1981, 2002, 2004, 2009, Steinheimer 2003b, 2006a, b, Jansen & Steinheimer 2017).

Supplying and preserving specimens was a hazardous affair, plagued by troubles. Apart from the difficulty in preserving specimens, one of the principal problems was the loss of cargoes in transit. The three loads Caspar Georg Carl Reinwardt (1773-1854) sent on the ships *Amsterdam*, *Ida Alyda* and *Admiraal Everssen* are a perfect example: the ships all sank in 1819. Alfred Russel Wallace (1823-1913) was dogged by similar misfortune when he lost his Amazonian collections due to a fire on the brig *Helen* in August 1852.

From cabinets of curiosity to museums

The predecessors for what were to become natural history museums first appeared in Europe during the 16th century. They were initially called 'cabinets of curiosity' (or 'Wunderkammer') and contained both artificially made and natural history items collected by members of the aristocracy, wealthy merchants, dealers and travellers; they quickly became an established phenomenon as symbols of social prestige and learning. Together with art galleries ('Kunstkammer'), they were among the forerunners of the public museums founded in the 18th and 19th centuries.[8] Royal collections were among the most extensive and exquisite examples.

Fig. 1-002 | POLYNESIAN WATTLED HONEYEATER *Foulehaio carunculatus*, 28 February 2017, NMW 52122 (*Justin JFJ Jansen © NMW*).
Arrived in NMW in, or before, 1806 and originating from Samoa, Fiji and Tonga which were seldom visited at that time by collectors of birds.

There were important royal collections in the Netherlands,[9] Sweden,[10] Germany,[11] Austria,[12] Italy,[13] Spain[14] and Russia.[15]

Some of these private collections would eventually form the basis for public museums. An example is the collection of John Tradescant, which became part of the Ashmolean Museum in Oxford. Another example is the private collection of Hans Sloane (1660-1753),[16] which went on to become the foundation of the British Museum in 1753. In France, the collection of René-Antoine Ferchault de Réaumur (1683-1757) was merged with the collections for the French Cabinet du Roi in 1757.[17] Another example is Bernardus Paladanus (1550-1633) in Enkhuizen, the Netherlands (Schulze-Hagen *et al*. 2003: 462) whose collections were used, amongst many others, by Carolus Linnaeus (1707-1778) for his *Systema Naturae* and by artist Olf Rudbeck Jr. (1660-1740) for the illustrations accompanying Linnaeus' work.[18]

Some early modern cabinets of curiosity were already named 'museums', such as the Museum Wormianum in Denmark (Morris 2012: 11), the Museum Tradescantianum in England,[19] and both the Museo Caspiano and the Museo Ferrante Imperato (Morris 2012: 11) in Italy. In general, the word museum originally referred to the collection itself, rather than to the building in which it was housed. Later, however, the designation shifted towards the building, an early example being the Ashmolean Museum.

Apart from private collections, natural specimens could also be found in institutional collections. Thus, universities often held natural history collections as well as collections for the teaching of anatomy.[20] Learned societies, such as the Royal Society (Thomas 2009) and the Paris Academy of Sciences, also held collections of natural objects apart from instruments and books. The world's oldest extant biological society, the Linnean Society of London, held an extensive bird collection from the 1790s onwards (Gage & Stearn 1988).

Museums which were open to the general public were scarce before 1800, as learning was primarily reserved for the wealthy or the clergy. This changed over time as the egalitarian and philanthropic ideals of the French revolution filtered down into national institutions, making knowledge more widely available. Many of the museums which opened their doors before

1800 still exist today in their own right or have formed the basis of an existing museum. In the Netherlands, there is the Teylers Museum,[21] in France, the Cabinet du Roi,[22] in Italy the Pavia University Museum,[23] in Germany the Staatliches Museum für Naturkunde[24] and in Austria the Naturhistorisches Museum Wien.[25] In England, the original museum founded by Ashton Lever[26] (Holophusicon) no longer exists because it was sold by public auction in 1806. In the USA, the first public museum was opened in Philadelphia in 1784 by Charles William Peale (1741-1827), who had a large private bird collection; it closed in 1844 (Walters 2003: 98).

How did one obtain specimens for a collection?

Commissioning and selling specimens was a lucrative and well-advertised trade as evidenced by newspapers such as the *Amsterdamse Courant* of October 1765 and onwards (Engel 1986: 11), in which birds and eggs were offered for sale. One of the famous dealers was Anna Maria Sibylla Merian (1647-1717), who was not only known as a dealer, but also as an artist (Engel 1986: 7, Wettengl 1998). An alternative way to acquire specimens was practised by the Amsterdam-based apothecary, Albertus Seba (Engel 1986: 7), who located sick crew members with whom he traded medicines for natural history items which had arrived with the newly docked ships (Holthuis 1995: 7). The crew was often known to trade specimens. At least seven crew members[27] possessed bird specimens from the third Cook expedition (1776-1880), obtained either by trade or by collecting specimens themselves.[28] [29] They were all involved in the dispersal of specimens from this voyage. Through these dealers, any accompanying data connected to the specimens often lost or replaced with erroneous or random information (e.g. Jansen 2016b).

Auctions were another frequently used route for acquiring specimens and curiosa; the first registered sale of birds in Great Britain took place at Christie's auction house on 6 June 1771.[30] In the Netherlands, the number of auctions was much higher (Engel 1986) and was clearly a popular way to expand one's collection. Notable Dutch auctions selling some rare birds were those of L. F. Holthuizen (Lichtenstein 1793) and Willem Sebastiaan Broers (d. 1792) (van Cleef & Schreurleer 1797).

Preservation

For most of these natural history collections, emphasis was placed on the acquisition of 'novelties', primarily new species, all of which were intended for public display or designated as 'duplicates' in museum archives. Once on display, they were often subject to less than ideal climatological conditions, damage by insects and other hazards, so that they soon faded or were ruined. Other problems included the minimal number of staff caring for the collections, most of whom were uneducated personnel, and random or uninformed directorial decisions. The numbers of decayed and spoiled specimens were therefore huge. George Shaw (1751-1813) is noted as having regularly enjoyed burning the deteriorated specimens from the British Museum basement in the museum gardens from 1808 onwards (Stearn 1981: 21-22). There were also considerable challenges to overcome once the specimens were exhibited or stored. Prior to their arrival, the dead specimens were treated in the field or on board as soon as possible.

The art of preserving specimens was already known by 1555, when people such as Conrad Gesner (1516-1565) and Pierre Belon (1517-1564) based a large part of their works on such specimens.[31] One of these preservation techniques is taxidermy, whereby the skin of an animal is preserved by inserting 'stuffing' and the bid is posed in a lifelike form, or by making it into a 'study skin'. Birds' feathers are made of keratin, and the skin in which the feathers are embedded is living tissue full of organic components, which are food for insects and an ideal breeding ground for bacteria and fungi. So, natural decay normally sets in quite quickly. The challenge is to preserve the feathers (which are less prone to decay) embedded in the skin and this requires an effective defence against harmful organisms. Insects, particularly the larvae of *Anthrenus* beetles, attack the fleshy parts of feet, wattles and skin, while moulds tend to grow on the beak, face and feathers. Woodworm will eat away the specimen's pedestal and case if given the chance.

In 1664, chemist Robert Boyle (1627-1691) discovered the value of alcohol for preserving animals: alcohol (spirits) removes water from the tissues and renders the body less easily digestible for insects and bacteria. Its use was, however, restricted due to the problems of getting the alcohol sufficiently concentrated. Loss of original colour of specimens is the main

problem when preserving in spirits (Ritchie 1924, Rohdenburg 1930), besides the soggy and distorted look they can take on. This method destroys much of the characteristic appearance of the species and reduces its usefulness for research. Another complicating factor is that the specimen must be kept in a leak-proof jar, which is difficult to maintain on a sea voyage. Specimens were preserved in fluids such as ethanol, neutral formalin and acetic acid-ethanol solutions (Maniatis & Panagiaris 2011).[32]

As noted before, long-term preservation was the fundamental issue in the development of modern taxidermy and until a solution was found, specimens did not last for any great length of time (Stresemann 1923, 1951b, Farber 1977, 1980, 1997). The first reports of bird skins being prepared was in 1517, when Dutch sailors brought back specimens including a Cassowary from the Indian Archipelago (Morris 2012: 10). The first taxidermy instructions were published by Pierre Belon in 1555, followed by Olina (1622) and Aitinger (1626-1631) and others (Schulze-Hagen *et al*. 2003). Belon's method promoted the use of salt, followed by other methods including the use of peppers and various spices in later years. Another method was to dry the specimen in an oven to mummify it, and some mounted specimens often contained large parts or even the entire skeleton (Schulze-Hagen *et al*. 2003, Morris 2012). Hans Ehrenreich von Geymann, followed by Wolfgang Helmherd Freiherr von Hohberg (1612-1688), was the first to experiment with arsenic and mercury (Schulze-Hagen *et al*. 2003: 473, Strekopytov 2017). Von Hohberg was followed by the French apothecary Jean-Baptiste Bécouer (1718-1777), who had been trying out chemicals for preserving bird skins and formulated a successful recipe for arsenic soap containing camphor, ground arsenic, soap, potassium carbonate and chalk during his experiments between 1738-1743 (Rookmaker *et al*. 2006, Morris 2012). In February 1797, François Levaillant (1753-1828) passed the recipe on to the MNHN (Morris 2012: 27, Jansen 2015a) together with 300 birds. Louis Dufresne (1752-1832), the MNHN senior taxidermist, was the first to publish this for a wider audience (Dufresne 1800, 1803, 1819).[33] This was soon followed by others, who made their preparations using Dufresne's recipe as a starting point (Nicolas 1801, Mouton-Fontenille 1811, Bullock 1817, Péquignot *et al*. 2006a, b). A recipe containing arsenic soap, white arsenic powder, formalin, tannin and chrome was used in museums until the late 1970s (Harrison 1976, Peguignot *et al*. 2006b, Morris 2012: 34). Chemicals were also used for the pest control of mice, rats and insects (Linnie 1990, Pinninger 1994, 2001, Querner 2015) and the skins themselves were protected with arsenic and other chemicals which are nowadays known to be a health risk (Irvin *et al*. 1972, Hawks & Williams 1986b, Linnie 1990, Sirois & Snasoucy 2001).

Once the skins had been prepared, there were two basic methods for stuffing birds: 1). the 'loose/soft stuffed' method, that prescribed the insertion of wires into the bird's skin via the legs, wrapping them together with a wire inserted from the head to the tail, thus forming

Fig. 1-003 | MAROON SHINING PARROT *Prosopeia tabuensis*,
28 February 2017, NMW 50243 (*Alex Bos © NMW*).
Arrived in NMW in, or before, 1806 and originating from Fiji which was seldom visited at that time by collectors of birds; it was introduced onto Tonga.

a supportive framework inside the skin. The skin was subsequently filled with chopped flax, raw cotton or a similar soft material; 2). the 'hard stuffed' method, that consisted in providing the specimen with an artificial body made of flax, jute fibre, straw, balsa wood, peat, tow or wood fibre, bound up with cotton to look like the original specimen. A long wire was thrust through the body and stuffing and was wound round it at one end to form the neck. This was then inserted into the back of the skull and attached to the neck wire. The replacement body was inserted into the skin and supporting leg wires stuck into it. These passed through the artificial body and were bent back into the solid mass to anchor them (Morris 2012: 46-47). Over time, legs, feet and often beaks became greasy as body fat soaked through the skin (Albert 1913). These body parts were often painted by the taxidermist so that they kept their original colours.

Obvious mistakes in the structure of the stuffed birds were commonly made, such as the position of the breastbone and feet. These were often altered when studies of anatomical structures became available (e.g. Owen 1866). Today, these collections are still used for field guides, identification guides and many other studies.

The oldest known stuffed specimen in existence is the African Grey Parrot *Psittacus erithacus* which died just after 1702 (Morris 2012: 39-41). The oldest skeleton is that of a Common Raven *Corvus corax* kept from the 'Kunstkammer' of Peter the Great, collected before 1714 (Morris 2012: 37). The biggest challenges in preserving these older specimens is maintaining the ideal temperature (Strang 1992) and preventing the fading of feathers (Horie 1986).

The quality of preserved specimens varies enormously, as everything depended on the skills of their collector and, more importantly, the taxidermist. The fact that preservation techniques using alcohol, mummification or skinning in the field were in the early stages of development made matters more complicated (Péron & Lesueur 1810a, Asma 2001, Steinheimer 2006a, Péquignot 2002, Morris 2012). Techniques gradually improved, and from the second expedition commanded by James Cook (1772-1775) the numbers of birds surviving today are in double figures. This marked a new era of successful preservation of specimens, thanks also to Johann Forster (1771), although many problems still remained. Forster preferred a rather quick preparation method, partly mummifying specimens and simultaneously using toxic arsenic soap to control insect pests rather than preparing them entirely.

It is possible to determine in which taxidermy workshop a specimen was prepared by using x-ray photography (Jansen & Steinheimer 2017, chapter 3.10), as the signature 'style', methods and materials were often passed on from one generation of craftsmen to the next.

Finding order in Nature

Before the late eighteenth century, hardly any naturalist specialized in the study of birds. Zoological works usually encompassed all known types of animals, and were considered to belong to the genre of natural history. Natural history itself, basically the description and classification of natural objects, began to develop into a scientific discipline in the 18th century. Natural objects were no longer studied as symbols for human qualities, and less and less as sources of evidence for the perfection of nature and divine wisdom. New standards for naming, classifying and describing animals were gradually introduced, although uniformity in such standards had to await the following century. Some universities founded chairs in natural history, and learned academies created special positions for natural history. Thus, in 1785, the Paris Academy extended the three 'classes physiques', anatomy, botany and chemistry, with a new 'classe' of natural history, involving three positions for 'pensionnaires', or members receiving a royal pension.

Although many people were involved, four men in particular should be singled out as having played a central role in defining ornithology and giving it direction: the Swedish botanist Carl Linnaeus (1707-1778); the English physician and naturalist, John Latham (1740-1837); the French zoologist and natural philosopher, Mathurin Jacques Brisson (1723-1806) and the French nobleman and student of nature, Georges-Louis Leclerc, Comte de Buffon (1707-1788) (Farber 2000: 6). Their systematic approach to naming, describing or ordering birds further inspired the study of ornithology in general. As with other fields of study, books were published which included ornithological contributions. For a list of these publications prior to 1800, see Table 1-003.

In 1736, Linnaeus introduced the idea of a basic binomial nomenclature, which he developed and expanded over the following years. This research resulted in the publication of

his *Species plantarum* that appeared in 1753. He introduced the binomial nomenclature for animals in rather brief scientific descriptions in the 10th edition of his *Systema Naturæ,* which was published in 1758. In this work, in Class II, 554 Aves, or bird species were introduced and divided into six orders (*Accipitres, Picae, Anseres, Grallae, Gallinae* and *Passeres*) and 63 genera. Linnaeus was always on the lookout for new species for his growing collection and a fair number of these still survive today (Wallin 2001). In order to spread the word about binominal nomenclature and to collect specimens for Linnaeus' collection, 17 of his most promising students, including Carl Peter Thunberg, Daniel Solander and Andres Sparrman were sent across the globe.[34] Linnaeus highly valued naming and classifying and his overall goal was to construct a catalogue of life (Farber 2000: 21).

In 1760, Brisson published his *Ornithologie* containing 115 genera, which were grouped into 26 orders, defined by the beaks and claws of the birds. This system of grouping resulted in considerably more orders than the six used by Linnaeus. *Ornithologie* contained no less than 1,500 species and varieties, all described fully in French. Brisson introduced his book with a history of ornithology and then described his efforts, based on a number of collections, particularly that of René-Antoine Ferchault de Réaumur (1683-1757) (Farber 1997). Contrary to Linnaeus, Brisson adopted a collection catalogue approach to his study of ornithology, using the random order of how the collection appeared in his museum rather than the six orders as published by Linnaeus (Farber 1997: 10). Bernard-Germain-Étienne de La Ville-sur-Illon, comte de Lacépède (1756-1828) published in 1799 *Tableaux Méthodiques des Oiseaux* and described 39 orders and 130 genera of birds (Knight 1866: 471, Sherborn 1899).

Buffon, director of the Royal gardens since 1739, also had the Jardin du Roi natural history collection under his supervision. To catalogue the collections in his care, Buffon commenced his monumental work *Histoire naturelle, générale et particulière* which he published between 1749 and 1788. It comprises 36 volumes, with 12 parts on birds that were published between 1770-1783. Buffon believed that he had uncovered a natural order among quadrupeds that reflected historical changes they had undergone (Farber 2000: 10). He speculated that species might change in response to changing environmental circumstances. His catalogue differs from Linnaeus' in that Buffon was uninterested in taxonomy, but rather provided detailed and extensive descriptions, including observations on behavior and habits. The descriptions range from just a few lines to tens of pages per animal and he also published engravings. His catalogue is written in French, including the bird names. Just like Linnaeus, Buffon expanded the collections under his care considerably using a network of correspondents he had built up all over the world during the course of his work. Unfortunately, due to the embryonic stage that preparation methods were in at that time, only a few samples are left today (chapter 3.9). Buffon disputed the meaningfulness of cataloguing nature by means of an artificial classification, as Linnaeus had attempted, and instead aspired to find the laws that governed the natural world and that explained its origin and changes over time. For Buffon, the comprehensive description of individual species (including humans), their propagation, living conditions and behaviour, was the first step towards uncovering the natural connections between them, in the past and present. Thus, Buffon historicized the study of the earth and the living world (Farber 2000: 21).

Latham identified many birds in various British museums and collections while working there and studying Brisson's writings. Latham's first ornithological work, *General Synopsis of Birds* (1781-1785), contained 106 illustrations by the author and it described many new species. In this work, like Buffon, he did not attach much scientific importance to the names of the species that he described, only describing them with an English name, a method which does not enable easy cross-checking or uniformity in nomenclature. Johann Friedrich Gmelin (1748-1804) published part 1 of the 13th edition of Carl Linnaeus' *Systema Naturæ* in 1788 and part 2 in 1789. It contained descriptions and scientific names of many new species described by Latham. In 1790, Gmelin published *Index Ornithologicus* where he specified a binomial name for all the species he had previously described. In the 19th century, Latham continued publishing articles on birds. In less than 10 years, Latham switched from using a collection catalogue approach of writing to constructing a catalogue of life.

The MNHN played a key role in the development of natural history in France. When it was founded in 1793, the museum offered several professorships, which were held by leading naturalists assisted by well-trained staff (Farber 2000: 25, 29). Two vital elements in the success

Fig. 1-004 | DODO *Raphus cucullatus*,
23 June 2005 (*Justin JFJ Jansen © Oxford University Museum of Natural History*).

of the MNHN were the position held by de Buffon in its predecessor, the Jardin du Roi, and the arrival of collections from near and far. Buffon's ambition drove the development of the Jardin du Roi, transforming it into a major centre of research and a repository for items that returned from French expeditions (Farber 2000: 28). The collections of exotic animals were particularly important, as these new resources fundamentally altered the study of natural history, inspiring the people who worked on the collections to diversify their research and create new disciplines such as comparative anatomy (e.g. Georges Cuvier).

Authors of early nineteenth-century books on birds such as Louis Vieillot and Coenraad Temminck used the MNHN specimens for their scientific descriptions of new species and were among the rapidly increasing number of naturalists who were specifically interested in ornithology. At the time, there were no specially designated curators for bird collections, as such positions would only be created in the second half of the 19th century.

Summarizing the situation around the departure of the Baudin expedition

When the Baudin expedition left France, the instructions may have been influenced by Buffon's ideas. Buffon pointed out that to provide a minimally adequate description of a species, one would need a male, a female and two juveniles (Walters 2003: 57). Buffon's students were taught to describe anything they encountered in a very extensive and exhaustive fashion rather than concisely (as seen in some of Péron's documents). Taking notes on the collector, the exact collection location and date were not part of the expedition's instructions.[35] Taxidermy as an art and the general and specific management of museums, were very much in their early stages and, on the basis of the knowledge on preservation available at the MNHN, the men who were to go on the expedition were taught how to preserve the precious specimens. Anatomical specimens were not part of the instructions and were not taken back.

Table 1-001 | Notable expeditions with natural history intentions 1758-1800. Described are the dates, country of origin of the expedition, the used ships, members that were involved in (possible) collecting activities, main countries visited, surviving specimens (for acronyms see: Materials and methods) and known publication on birds from the specific expedition.

Dates	Country	Boats	Members
1764-1766	UK	*HMS Dolphin* *Tamar*	• Captain: John Byron (1723-1786)
1766	UK	*Niger*	• Constantine Phipps (1744-1792) , Sir Thomas Adams (1738-1770) • Naturalists: Joseph Banks (1743-1820)
1766-1768	UK	*HMS Dolphin* *HMS Swallow*	• Captain: Samuel Wallis (1728-1795) (*leader*), Philip Carteret (1733-1796) (*HMS Swallow*) • Second Lieutenant: Tobias Furneaux (1735-1781)
1766-1769	France	*La Boudeuse* *L'Etoile*	• Captains: Louis Antoine de Bougainville (1729-1811) (*leader*), Nicolas Pierre Duclos-Guyot (*La Boudeuse*), François Chenard de la Giraudais (1727-1775) (*L'Étoile*) • Naturalist: Philibert Commerson (1727- 1773)
1768-1771	UK	*HMS Endeavour*	• Captain: James Cook (1728-1779) • Naturalists: Joseph Banks and Daniel Solander (1733-1782) • Cartoonist: Sydney Parkinson (1745-1771)
1771-1772	France	*Isle de France* *Le Nécessaire*	• Captains: Chevalier de Coëtivi (*Isle of France*) and M. Cordé (*Le Nécessaire*) • Naturalist: Pierre Sonnerat (1748-1814)
1771-1772	France	*La Fortune* *Le Gros-Ventre*	• Captains: Yves Joseph de Kerguelen-Trémarec (1734-1797) and Louis Aleno de Saint-Aloüarn (1738-1772)
1772-1773 & 1774-1775	Spain	*Aquila* *Jupiter*	• Captain: Domingo de Boenechea (1730-1775)
1772-1775	UK	*HMS Resolution* *HMS Adventure*	• Captains: James Cook (1728-1779) (*HMS Resolution*) chief of expedition, Charles Clerke and Tobias Furneaux (1735-1781) (*HMS Adventure*). • Surgeon-naturalist: William Anderson (1750-1788). • Naturalists: Johann Reinhold Forster (1729-1798), Georg Forster (1754-1794) and Anders Sparrman (1748-1820)
1772-1775	UK	*Sir Lawrence*	• Joseph Banks, Daniel Solander (1733-1782) and John Gore (c. 1730-1790)
1773-1774	France	*Le Roland* *L'Oiseau*	• Captain: Yves Joseph de Kerguelen-Trémarec (1743-1797) • Naturalist: Jean-Guillaume Bruguière (1750-1798)
1773-1774	UK	*HMS Racehorse* *HMS Carcass*	• Captain: Constantine John Phipps (1744-1792) • Physician-naturalist: Charles Irving (1734-1794)
1774	Spain	*Santiago*	• Captain: Juan José Pérez Hernández (1725-1775)
1775	Spain	*Santiago* *Sonora*	• Captains: Bruno de Heceta (Hezeta) y Dudagoitia (1743-1807) (*Santiago*) and Juan Francisco de la Bodega y Quadra (1743-1794) (*Sonora*)
1775-1776	Spain	*Aquila*	• Captain: Juan Cayetano de Lángara y Huarte (1736-1806)
1776-1780	UK	*HMS Resolution* *HMS Discovery*	• Captains: James Cook (1728-1779) (*HMS Resolution*) and Charles Clerke (1741-1779) (*HMS Discovery*) • Naturalist Surgeons: William Anderson (1750-1788) and William Ellis (1747-1810) • Illustrator: John Webber (1750-1793)

Prime locations visited	Surviving specimens	Publication(s) on birds
Madeira, Cape Verde Islands, Brazil, Patagonia, Tahiti, Tuamotos, Tokulu, Kiribati, Marianas, Java, South Africa	-	Byron 1767
Newfoundland, Labrador	-	
Tuamaotos, Tahiti, Uvea, Marianas, Java, Tonga, Solomon Islands, New Ireland, Sulawesi, Java, South Africa, St. Helena	-	Robertson 1948
Argentina, Chile, Tuamotos, Tahiti, Samoa, Vanuatu, New Guinea, Solomons, Java	1 MNHN	Jansen 2017c
Tahiti, New Zealand, Australia, Austral Islands Java, St Helena	-	Stresemann 1949, 1950, Whitehead 1969, 1978, Medway 1976, 1979, 1981, 2002, 2004, 2009, Steinheimer 2003b, 2006a, b, Jansen & Steinheimer 2017
Seycelles, Phillipines (Lucon, Mindenao) and Moluccas (Gebe, Panay)	Unknown - possible	Sonnerat 1776, Ly-Tio-Fane 1976
Mauritius, Kerguelen Island, Australia, Timor, Java	-	
Tuamotos, Austral Islands, Tahiti	-	
Madeira, Cape Verde Islands, South Africa, Australia, New Zealand, Easter Island, Norfolk Island, New Caledonia, Vanuatu, Tahiti, Tonga, Marquesas, South Georgia, South Sandwich Islands	Unknown - possible	Stresemann 1949, 1950, Whitehead 1969, 1978, Medway 1976, 1979, 1981, 2002, 2004, 2009, Steinheimer 2003b, 2006a, b, Jansen & Steinheimer 2017
Iceland, Hebrides	-	
Kerguelen Island	-	
Svalbard	-	
Queen Charlotte Islands, Nootka, USA	-	
USA, Alaska	-	
Peru, Tahiti	-	
Tenerife, South Africa, Tasmania, New Zealand, Tahiti, Tonga, Palmerston Island, Hawaii, Austral Islands, Cook Islands, USA, Alaska, Russia, Japan, Macao	2+	Stresemann 1949, 1950, Whitehead 1969, 1978, Medway 1976, 1979, 1981, 2002, 2004, 2009, Steinheimer 2003b, 2006a, b, Jansen & Steinheimer 2017

Dates	Country	Boats	Members
1779	Spain	*Favorita* *La Princessa*	• Captains: Ignacio de Arteaga y Bazán (1731-1783) (*Favorita*), Juan Francisco de la Bodega y Quandra (*La Princessa*)
1780-1781	Spain	*La Princessa*	• Captains: Francisco Antonio Mourelle de la Rúa (1750-1820)
1783-1784	UK	*Antelope (Oroolong)*	• Captain: Henry Wilson (1740-1810)
1785-1787	UK	*Sea Otter*	• Captain: James Hanna (x-1787)
1785-1786	UK	*Captain Cook Experiment*	• James Charles Stuart Strange (1753-1840) (*Captain Cook*) financer, Henry Laurie (*Captain Cook*) and Henry Guise (*Experiment*)
1785-1788	France	*La Boussole* *L'Astrolabe*	• Captain: Jean-François de La Pérouse (1741-1788) (*La Boussole*) and Paul-Antoine-Marie Fleuriot de Langle (1744-1787) (*L'Astrolabe*) • Naturalists: Jean-André Mongez (1751-v. 88) , Louis Dufresne (1752-1832)
1785-1788	UK	*HMS Queen Charlotte* *King George*	• Captains: Nathaniel Portlock (*King George*) and George Dixon (*Queen Charlotte*)
1785-1794	Russia	*Slava Rossy*	• Captain: Joseph Billings (c. 1758-1806) • Surgeon: Michael Robeck, Peter Allegretti • Naturalists: Carl Heinrich Merck (1761-1799) and Carl Krebs
1786-1787	UK	*Nootka* *Sea Otter*	• Captains: John Meares (c. 1756-1809) (*Nootka*) and William Tipping (*Sea Otter*)
1788-1789	UK	*Felica Adventura* *Iphigenia Nubiana*	• Captains: John Meares (*Iphigenia Nubiana*) and William Douglas (x-1791)
1789-1794	Spain	*Descubierta* *Atrevida*	• Captains: Alejandro Malaspina (1754-1810) (*Descubierta*) and Jose de Bustamante and Guerra (1759-1825) (*Atrevida*) • Naturalists: Antonio Pineda and Ramirez (1751-1792), Thaddäus Haenke (1761-1817), Luis Née (V. 1789-1794) and Tomas de Suria
1790-1792	France	*La Solide*	• Captain: Étienne Marchand (1755-1793
1791-1793	UK	*HMS Providence* *HMS Assistant*	• Captain: William Bligh (1754-1817) • Surgeon: Thomas Dancer (v. 1750-1811)
1791-1794	France	*La Recherche* *L'Espérance*	• Captains: Bruni d'Entrecasteaux (1737-1793) (*La Recherche*) and Jean-Michel Huon de Kermadec (1748-1893) (*L'Espérance*) • Naturalists: Jacques-Julien Houtou de La Billardière (1755-1834), Claude-Antoine-Gaspard Riche (1762-1898), Jean Blavier (1764-1828), Louis Ventenat (1765-1794) and Louis-Auguste Deschamps (1765-1842)
1791-1795	UK	*HMS Discovery* *HMS Chatham*	• Captains: George Vancouver (1757-1798) (*Discovery*) and William Robert Broughton (1763-1822) • Naturalist: Archibald Menzies (1754-1842)
1796-1798	France	*Belle Angelique*	• Captain: Nicolas Baudin (1754-1803) • Naturalist René Maugé (1757-1802)
1786-1792	Russia	-	• Billings-Saryčev Expedition

Prime locations visited	Surviving specimens	Publication(s) on birds
Alaska	-	
New Guinea, Solomon Islands, Tonga, Tuvalu, Guam, Mexico	-	
New Guinea, Palau	-	
Nootka, Vancouver Island	-	
Java, Nootka, Vancouver Island	-	
Australia, Russia, Macao, Phillipines, Samoa, Alaska, USA, Hawaii, Easter Island, Solomon Islands, New Caledonia	-	
Fur Trade: Falkland Islands, Hawaii, Alaska, Macao	-	Beresford & Dixon 1789, Banko & Banko 1981, Frohawk *et al.* 1989, Munro 1944
East Siberia, Alaska, Aleutians, Kodiak Island	-	
Alaska	-	
Alaska, Philippines, Hawaii, China	-	
Argentina, Falklands, Chile, Peru, USA, Alaska, Phillipines, Australia, New Zealand, Tonga	-	Olson 2006
Cape verde, Marquesas Islands, Alaska, Hawaii, Macao, Mauritius	-	
Tahiti, Puerto Rico	-	
Java, Buru, Waigeo, New Ireland, Australia, New Caledonia, New Hebrides, Fiji	> 72 MNHN	Jansen 2017b, c
South Africa, Australia, Hawaii, USA, Alaska, Canada	2-3 NMUK	Prŷs-Jones *et al.* 2014
Tenerife, St. Thomas, St. Croix and Puerto Rico	140, various collections	Jansen 2017f
Siberia	22 MNHN	

Table. 1-002 | Examples of private expeditions prior to 1800, on which birds are known to have been collected.

Years	Collector	Collecting location		Surviving specimens
1768-1774	Peter Simon Pallas (1741-1811)	Siberia, Caspian Sea, Crimea	-	-
1772-1774	Charles-Nicolas-Sigisbert Sonnini de Manoncourt (1751-1812	Cayenne, Guyana	MNHN	1
1772, 1775-1776	Anders Sparrman	Particiapated on the second voyage by James Cook, and collected in South Africa	NMS	8
1773	James Bruce (1730-1794)	Ethiopia	MNHN	-
1774-1781	Pierre Sonnerat (1748-1814)	India, China	MNHN	31
1775	Carl Peter Thunberg	South Africa, Japan	-	-
1781-1789	Louis-Claude Richard (1754-1821)	Cayenne, Argentina, Brazil, Antilles	MNHN	8
1781-1784	François Levaillant (1753-1824)	Southern Africa	MNHN	8
1781-1800	Thomas Davies (1737-1812)	Australia	-	-
1783-1785	René-Louiche Desfontaines (1750-1833)	Algeria, Tunesia	MNHN	4
1783-1785	Alexandre Rodrigquez Ferreira (1756-1815)	Brazil	MNHN	-
< 1785	Louis de Chenier (1723-1796)	Turkey or Morocco	MNHN	-
1786	Jean-Charles Brocheton	Cayenne	MNHN	7
1786	Jean-Baptiste Leblond (1767-1802)	Cayenne	MNHN	23
1788-1789	Joseph Martin (x-1826)	Cayenne	MNHN	61
< 1793	Lefevre Deshayes	Dominican Republic	MNHN	-
< 1793	Mr. De la Borde	Cayenne	MNHN	2
< 1793	Mr. Arthur	Cayenne	MNHN	-
1795	Antoine-Christophe Merlin (1762-1833)	Cayenne / France	MNHN	
1797-1800	Louis Augustin Guillaume Bosc (1759-1828)	USA	MNHN	6
1798	Mr. Depille	USA	MNHN	-
1798	Guillaume Brugnieres (1750-1798)	Egypt	MNHN	-
1798-1801	Johann Centurius Graf von Hoffmannsegg (1766-1849)	Iberia	-	-
1799-1801	M. le Reveilliere	South America	MNHN	-
< 1800	Michel Adanson (1727-1806)	Senegal	MNHN	1
< 1800	M. de la Brousse	Cayenne	MNHN	-

Table. 1-003 | The important publications featuring annotations of birds prior to 1800.

Author	Year	Title
Linnaeus, Carl	1758	*10th edition of Systema Naturae*
Brisson, Mathurin-Jacques	1760	*Ornithologie*
Pontoppidan, Erik	1763	*Den Danske atlas eller Konge-Riget Dannemark*
Brünnich, Morten Thrane	1764	*Ornithologia Borealis*
Daubeton, Edme-Louis et al.	1765-1783	*Planches enluminée*
Scopoli, Goivanni Antonio	1769-1772	*Anni Historico-Naturales*
Nozeman, Cornelius	1770	*Nederlandsche Vogelen*
Buffon, George-Louis-Leclerc	1770-1783	*Histoire Naturelle des Oiseaux*
Turnstall, Marmaduke	1771	*Ornithologica Brittanica*
Schäffer, Jacob Christian	1774	*Elementa Ornithologica*
Müller , Philipp Ludwig Statius	1776	*Linnaeus's Natursystem'*
Cetti, Francesco	1776	*Uccelli di Sardegna*
Manetti, Saverio	1776	*Storia naturale degli uccelli*
Brown, Peter	1776	*New illustrations of Zoology*
Sonnerat, Pierre	1776	*Voyage à la Nouvelle-Guinée*
Molina, Juan Ignacio	1778	*Saggio sulla storia naturale del Chile*
Blumenbach, Johann Friedrich	1779-1780	*Handbuch der Naturgeschichte*
Spallanzani, Lazzaro	1780	*Dissertationi di fisica animale e vegetale*
Latham, John	1781-1783	*Synopsis of Birds*
Blumenbach, Johann Friedrich	1782	*Handbuch der Naturgeschichte*
Buchoz, Pierre Joseph	1782	*Les dons merveilleux et diversement coloriés de la nature dans le règne animal, ou collection d'animaux précieusement coloriés*
Sonnerat, Pierre	1782	*Voyage aux Indes orientales et à la Chine, fait depuis 1774 jusqu'à 1781*
Daubeton, Pieter	1783	*Table des Planches enluminées*
Shaw, George	1784	*Zoology of New Holland*
von Jacquin, Joseph Franz	1784	*Beyträge zur Geschichte der Vögel*
Latham, John	1785	*Synopsis of Birds*
Pennant, Thomas	1785	*Arctic Zoology*
Sparrman, Anders Erikson	1786-1789	*Catalogue of the Museum Carlsonianum*
Tunberg, Carl Peter	1787	*Museum naturalium Academiæ Upsaliensis*
White, Gilbert	1789	*Natural History and Antiquities of Selborne*
Gmelin, Johann Friedrich	1788-1789	*13th edition of Systema Naturae*

Author	Year	Title
Phillip, Arthur	1789	*The Voyage of Governor Phillip to Botany bay*
Shaw, George	1789-1813	*The Naturalist's Miscellany or Coloured Figures Of Natural Objects; Drawn and Described Immediately From Nature*
Bruce, James	1790	*Travels to discover the source of the Nile in 1753-1824*
Bonaterre, Pierre-Joseph	1790-1791	*Tableau encyclopédique et méthodique des trois règnes de la nature, Ornithologie*
Latham, John	1790	*Index ornithologicus*
White, John	1790	*Journal of a Voyage to New South Wales*
Meyer, Friedrich Albrecht Anton	1793	*Systematisch-summarische Uebersicht der neuesten zoologischen Entdeckungen in Neuholland und Afrika*
Spalwosky, Joachim Johann Nepomuk	1793	*Beytrag zur Naturgeschichte der Vögel*
Donovan, Edward	1794	*Natural History of British Birds*
Levaillant, François	1796-1808	*Histoire Naturelle des Oiseaux d'Afrique*
Bewick, Thomas	1797-1804	*A History of British Birds*
Levaillant, François	1797	*Oiseaux d'Afrique*
Daudin, François-Marie	1799	*Traité élémentaire et complet d'Ornithologie*
de Lacépède, Bernard-Germain	1799	*Discours d'ouverture et de clôture du cours d'histoire naturelle*
de Lapeyrouse, Philippe-Isidore Picot	1799	*Tables méthodiques des mammifères et des oiseaux observés dans le département de la Haute-Garonne*