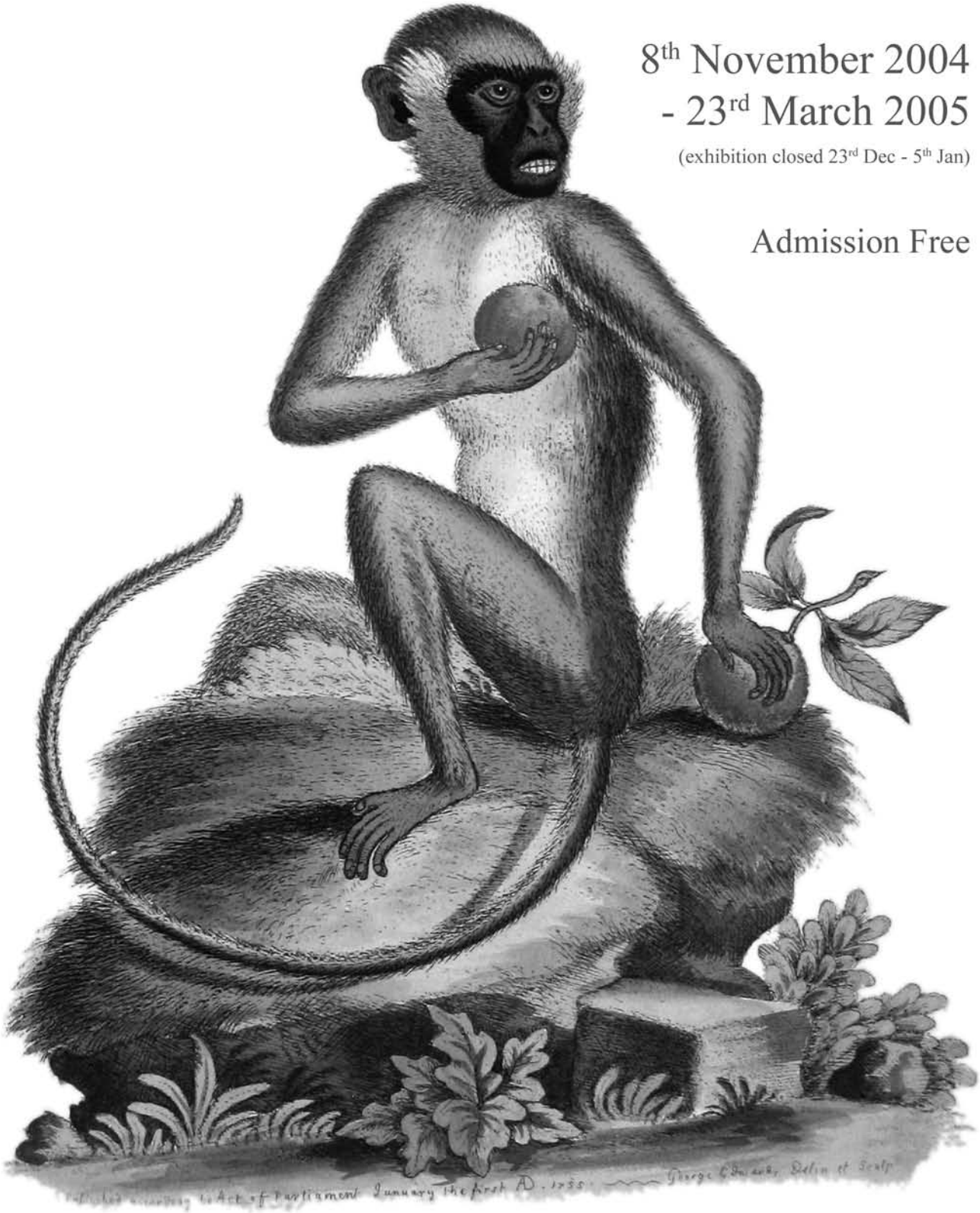
NATURAL HISTORY ILLUSTRATED

From the Collections of Senate House Library, University of London



8th November 2004
- 23rd March 2005

(exhibition closed 23rd Dec - 5th Jan)

Admission Free

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Illustration: The St Jago Monkey from Gleanings of Natural History, George Edwards (London: G. Edwards, 1758) Vol I

Introduction

The collections of the Senate House Library, University of London are rich across the broader arts, humanities and social sciences. Less well known, however, are the Library's holdings in the history of science and, more specifically, in natural history. This exhibition, *Natural History Illustrated*, may therefore provide some surprising and pleasing insights.

Natural history appeals from various viewpoints. Interests may include the direct subject of study, insight into knowledge of a particular time, illustration, local history or awareness of foreign countries. Contributors to natural history may be scientists, taxonomists, explorers, or artists; they may be professionals or amateurs. We have deliberately chosen illustrated works, with an immediate visual impact. Within this unifying theme of illustration, we have approached different subjects in diverse ways. Many texts, for example, focus on natural history or the related subject of travel. Others, for example, literary and emblematic works, show additional uses to which natural historical illustration may be put.

We have selected the following themes:

- Early works
- Scientific exploration and discovery
- Periodicals
- Amateur naturalists
- Microscopy
- Ornithological works
- Botanical works

A case on *early works* forms an introduction to the exhibition. *Microscopy*, in the centre, shows an impetus for modern scientific study by providing opportunities previously impossible in all areas of natural history. Interest in natural history exploded from the early eighteenth century, and the cases on *amateur naturalists* and *scientific exploration and discovery* demonstrate two different approaches. A case on *periodicals* focuses attention on their place within the history of publishing; the items shown here contrast with several of the larger works displayed in other cases, published by subscription. Cases on *ornithology* and *botany*, two especially popular branches of natural history, provide a sample of the development and range of publications in these areas. Finally, the books in the wall case are examples of particularly large and fine illustrated works.

'Natural History Illustrated' was researched by Dr Karen Attar, Rare Books Librarian; Roy Moxham, Conservation and Preservation Officer; Mike Mulcay, Team Leader, Special Collections; and Lesley Price, Archivist. It was mounted by Roy Moxham.

We hope that you enjoy our selection.

Christine Wise
Head of Special Collections

Collections featured in this exhibition

The Senate House Library, formerly known as the University of London Library, was formally opened in 1877 in Burlington Gardens. It moved from its second home, in South Kensington, to its current location in 1937. The Library holds nationally and internationally important collections across the humanities and social sciences. The holdings comprise over 2 million titles and fill the fourth to the nineteenth floors of the Senate House Tower. Many of the books exhibited here are taken from the Library's research collections. The following named special collections are also featured:

Durning-Lawrence Library and Archives: Approximately 5,750 items bequeathed by Lady Durning-Lawrence in 1929. This was, with some additions, the library of Sir Edwin Durning-Lawrence (1837-1914), a protagonist in the Bacon-Shakespeare controversy, and is especially strong in works relating to Francis Bacon.

Sterling Library: Approximately 7,000 items built upon the 4,200-item strong collection of Sir Louis Sterling (1879-1958), presented to the University of London in 1956. The library comprises primarily early and fine editions of English literature.

Harry Price Library of Magical Literature: Approximately 13,000 titles built upon the collection of about 10,000 items bequeathed by publicist and psychical researcher Harry Price (1881-1948). It covers all areas of magic and psychical research.

Further information about these and other named special collections, archives and manuscripts is available on the Library's website at: http://www.shl.lon.ac.uk.

Case 1

EARLY WORKS

Early use of natural history illustrations developed from the representation of known and mythical creatures drawn in certain artistic traditions in which scientific accuracy in the modern sense was not sought. Creatures were represented often to illustrate religious or moral points and placed in particular historical or mythological contexts. In certain fields there was arguably an earlier development in a 'modern' approach with publications such as herbals which were of direct practical use, where accuracy of representation was important.

The *Ashmole Bestiarium* dates from around the thirteenth century and is probably English, perhaps from Peterborough. It contains around 130 miniatures and 6 full-page illustrations. Included amongst the animals is a unicorn, indicating the diverse sources from which the medieval bestiary derived its images.

From the sixteenth and seventeenth centuries, when they were most popular, through to the nineteenth century, emblem books often contained images drawn from natural history. In these picture books of 'hieroglyphs', in which the text and image interacted, pictures of real and mythological creatures would often be read allegorically. The Library holds many examples of emblem books, and the work displayed, *Omnia Andreae Alciati V.C. Emblemata*, illustrates a chameleon to symbolise flattery. The popularity of such uses of natural history images overlapped with the development of a more scientific approach to illustration.

Herbals were intended to be useful works, and the example shown indicates that they were also a popular form of publication. The Flemish physician and botanist Rembert Dodoens (1517-1585) originally published his work in Dutch in 1554. This English translation by Henry Lyte, *A Nieuwe Herball,* was derived from a French edition of 1557 – indicating the close commercial links in European publishing in the sixteenth century.

Woodcut illustrations had a long life, and blocks were frequently reused or plagiarised for different editions or completely different publications. Much of Edward Topsell's *The Historie of Four-Footed Beastes and Serpents* is based on Konrad Gesner's *Historia Animalium* published in Zurich in the mid-sixteenth century, an important early attempt at the classification of animals, including mythological beasts. In addition to the

text many illustrations were re-used; the image shown is derived from the woodcut of a rhinoceros by Albrecht Dürer used by Gesner.

Bestiarium: die Texte der Handschrift Ms. Ashmole 1511 der Bodleian Library
Graz: Akademische Druck- und Verlagsanstalt, 1986
fol. CC25.79 [Oxford. Bodleian]

Facsimile edition.

A Nieuwe Herball
Robert Dodoens; trans. by Henry Lyte
Antwerp: H. Loe; London: G. Dewes, 1578
* T [Dodoens] fol.

The page of the copy on display has, fortuitously, a pressed plant inserted at some point in the book's history alongside the woodcut illustrations.

Omnia Andreae Alciati V.C. Emblemata
Andrea Alciati
Paris: F. Gueffier, 1608
[D.-L.L.] F3 [Alciatus – 1608]

History of Four-Footed Beasts and Serpents
Edward Topsell
London: G. Sawbridge, 1658
* Q [Topsell] fol**.**

Posthumous edition of a work first published in 1607.

Case 2
SCIENTIFIC EXPLORATION AND DISCOVERY

Before the late eighteenth century, few voyages around the globe could be described as being for scientific purposes. Voyages of exploration and discovery were undertaken for military reasons, as commercial or privateering ventures, to establish or control trade routes, or to exploit new markets. *Voyages and Travels into Brasil* (1703) by Johannes Nieuhof (1618-1672) is an account of the author's travels while employed

by the Dutch West India Company during the period 1643-72, and the engraving shows edible plants and trees of economic importance. The work was first published in English after Nieuhof's death.

Other illustrative personal accounts of exploration include *A Voyage to the South Sea, and Round the World* (1712) by Edward Cooke. This work is noteworthy in that it is the first published account of the expedition responsible for the rescue of Alexander Selkirk, the inspiration for the eponymous hero of Daniel Defoe's *Robinson Crusoe* (1719). The work is in journal form, and includes plates showing people, plants and animals encountered, along with descriptions of customs and habits.

Captain James Cook's voyage of 1768-71, undertaken at the suggestion of the Royal Society to observe the transit of Venus in the Pacific, was one of the first to be carried out for scientific reasons. Towards the end of the eighteenth century, such voyagers were bringing back countless new species of plants and animals, all new to the Western scientific world. There was a mania for collecting and classification. *Museum Richterianum* (1743) is an example of a catalogue of a collection, in this case that of the Leipzig banker Johann Christoph Richter (1678-1751). It describes and illustrates his collection of minerals, fossils and gems, and includes detailed discussion of the development of natural history collecting and systematic mineral classification.

By the early nineteenth century, voyages of scientific endeavour were becoming much more commonplace, with naturalists employed to collect, classify and transport back an increasing range of flora and fauna. Charles Darwin acted as naturalist on the voyage of HMS Beagle (1831-6); descriptions of the zoology of the voyage, with illustrative plates, were published in parts between 1838 and 1843. A contemporaneous voyage by Captain Beechey to the Northern Pacific influenced Darwin's work, particularly in relation to reefs. Scientific descriptions of animals collected on this voyage were published in 1839, and the plate in the exhibition is from a series of reptiles described by John Edward Gray (1800-1875) of the British Museum.

'Voyages and Travels into Brasil and the East Indies'
Johannes Nieuhof
A Collection of Voyages and Travels, Some Now First Printed from Original Manuscripts, Others Translated out of Foreign Languages and Now First Published in English, Vol. 2
London: Awnsham and J. Churchill, 1704
f L 34 Chu

A Voyage to the South Sea, and Round the World, Perform'd in the Years 1708, 1709, 1710, and 1711
Captain Edward Cooke
London: B. Lintot and R. Gosling, 1712
[S.L.] I [Cooke – 1712]

Museum Richterianum
Johann Ernst Hebenstreit
Leipzig: C. Fritsch, 1743
* R4 [Hebenstreit] fol.

The Zoology of the Voyage of the H.M.S. Beagle. Pt. 2,1: Mammalia
George R. Waterhouse; ed. by Charles Darwin
London : Smith, Elder, 1838
[D.-L.L.] S° [Darwin] fol. Strong Room

The lithograph on display is the Patagonian Pampas Cat or *Felis Pajeros*.

The Zoology of Captain Beechey's Voyage
Frederick William Beechey
London: H.G. Bohn, 1839
V° [Beechey] fol.

Case 3
PERIODICALS

From the mid-1660s periodicals began to appear as a means of scientific communication, and in the process they used illustration to convey a visual dimension to the information presented. In Britain the *Philosophical Transactions of the Royal Society* was published from 1665. Among its wide range of articles were papers on aspects of natural history, occasionally illustrated by black and white woodcuts. The issue displayed is unusual in that the illustration has been coloured. *Acta Eruditorum*, published in Leipzig from 1682, was an attempt by its editor, Otto Mencke, to disseminate new learning by publishing Latin translations of papers and articles from scientific publications produced

throughout Europe. Illustrations were frequently reproduced from the source publication, as in the example shown of a musk-hog.

During the eighteenth century there was a continuing growth of scientific journals, often illustrated with black and white woodcuts. However, from its first issue in 1787 the *Botanical Magazine* of William Curtis (1746-1799) featured hand-coloured engravings. It prospered, selling 2,000-3,000 copies per issue, and the magazine's success encouraged similarly illustrated rivals to appear. James Sowerby (1757-1822) was the principal artist. Since 1801 its title has been *Curtis's Botanical Magazine*, and publication as a periodical with colour illustrations of plants has been continuous. Later in the nineteenth century the *Transactions of the Zoological Society of London* featured extensive illustrations, many in colour, including lithographs by Joseph Wolf (1820-1899), as in the illustration shown. The nineteenth century and then the twentieth witnessed a massive growth in periodical publishing, leading to countless well-illustrated scientific periodicals in every speciality. The Ray Society, founded in 1844 to publish works in natural history, provides an example of colour printing from the first half of the twentieth century in the second volume of T.A. Stephenson's *The British Sea Anemones* (1935).

From the early nineteenth century the growth of a literate public encouraged publishers to produce popular scientific magazines which often included natural history illustrations, usually in the form of small woodcuts. Such popular magazines are still familiar today, with rather more lavish illustrations. Additionally, natural history became a topic covered by the general magazines of the nineteenth century, and illustrations formed a major feature of such publications. An 1893 issue of the popular general magazine *Leisure Hour*, published in London, is displayed showing an example of a regular feature, 'Natural History Notes'. James Sibree here recounts the fate of the Great Auk, which he thinks to be extinct, and the article indicates the number of creatures that were sacrificed in the pursuit of scientific knowledge and the associated urge to collect. Many illustrations were made from dead specimens.

Acta Eruditorum
1682
PR [N – Acta Eruditorum]

'Tajacu, seu apri Mexicani Moschiferi', by Edward Tyson (1650-1708). The image shown accompanies an article translated from its original English version in the *Philosophical Transactions of the Royal Society.*

The illustration is missing from the Library's copy of the *Philosophical Transactions.*

Philosophical Transactions of the Royal Society, Vol. 38, no. 432
1733-4
PR Special Collections

'Experiments and Observations on Bulbous Roots', by William Curteis.

Botanical Magazine, 2
1796
PR Special Collections

'Passiflora Alata = Winged Passion-Flower', with an illustration by James Sowerby.

Transactions of the Zoological Society of London, 5
1866
PR [V – Zoological]

'Contributions to the Natural History of Anthropoid Apes, no. VIII', by Professor Owen. Illustration by Joseph Wolf.

Leisure Hour, 42
1892-3
PR [Z – Leisure]

'Latest Tidings of the Great Auk', by James Sibree.

The British Sea Anemones, Vol. 2
T.A. Stephenson
London: Ray Society, 1935
Ray Society Monograph Series, No. 121
PR [Q – Ray Society]

The author states that he had financial help in enabling colour plates to be published in his book.

Case 4

AMATEUR NATURALISTS

The term ‘naturalist’, meaning one who studies the natural rather than the spiritual, dates from 1527. By 1600 the word had broadened to mean one who is interested in or makes a special study of animals or plants, and by the early eighteenth century it had come to imply a lack of technical training. In contrast, the term ‘scientist’ meaning one with expert knowledge, using scientific methods, is not recorded until 1834. Modern ‘science’, then, emerged in the post-renaissance European world, and was characterised by systematic, detailed observation and classification from nature, using taxonomic systems created by individuals such as Linneaus (*Species Plantarum*, 1753; see Case 7). Yet the concept of the ‘professional’ scientist, employed to undertake research in a narrow field, is a much later construct.

The study of natural history has never been restricted to the professional naturalist. The tradition of amateur field natural history dates back to before the mid-eighteenth century. One of the best known of the eighteenth- and nineteenth-century amateur parson-naturalists is Gilbert White (1720-1793). His *Natural History and Antiquities of Selbourne* (1789) is a classic account of the natural landscape, wildlife and ancient relics found within the vicinity of his parish, and is a model of observation of the natural world.

During much of the eighteenth century, natural history study was predominantly a recreation pursuit of the leisured classes, gentry and clergy. Its appeal spread during the late eighteenth and the nineteenth centuries, and zoological, botanical and archaeological fieldwork satisfied both a need for intellectual curiosity and for self-improvement. Local natural history societies were established, whose publications popularised the study of natural history in microcosm. The example shown is from the *Proceedings of the Somerset Archaeological and Natural History Society* and includes colour lithographs made from original sketches of sea life along the Bristol Channel. The Society has founded in 1849; by 1851 it had 420 members, and it is still active today.

The study of natural history was seen as a suitable pursuit for women of the middle and upper classes. They experienced the natural world through personal observation, putting together collections of specimens, and, in particular, drawing and sketching from nature. The two volumes of archival material in the exhibition, one of watercolours (here open at a

picture of seashells), and the other of pressed seaweed specimens, were both compiled by Victorian women.

The Natural History and Antiquities of Selbourne in the County of Southampton
Gilbert White
London: B. White and Son, 1789
[D.-L.L.] Q° [White]

Proceedings of the Somerset Archaeology and Natural History Society, Vol. 10
1860
MWNb Som

'Notice of Emblemtonia Pallida', by W.A. Sanford.

Volume of Watercolour Drawings by Emma Hill, Presented to her Niece Edith Smith (later Lady Durning-Lawrence), 5 Nov 1870
1870
DLLA/22

Collection of Pressed British Seaweeds, 'Sold in Aid of the Fund for the Repairs of Rock Church'
[c. 1870s]
DLLA/26

Probably compiled by the wife of John Edward Gray (see Case 2).

Case 5
ORNITHOLOGICAL WORKS (1)

L'Histoire de la Nature des Oyseaux
Pierre Belon
Paris: Corrozet, 1555
Strong Room V3 [Belon] fol.

Pierre Belon (1517-1564) is famous as the first naturalist in modern times to use comparative anatomy in classification, echoing the Aristotelian emphasis on homologies. By illustrating birds eating, he further indicated

habits and habitat. In his natural history of birds, Belon illustrates, classifies and describes approximately 200 species, including original observations and concepts which made a deep impression on contemporary and later science.

The Ornithology of Francis Willughby
Francis Willughby and John Ray
London: Martyn, 1678
* V3 [Willughby] fol.

John Ray and Francis Willughby applied the Aristotelian concept of natural groups based upon a range of characters to both fishes and birds. They applied classification based on dissection, and dealt with birds in their natural groups. The *Ornithology*, which Ray translated into English, remained a standard work for over a century. The illustrations, which do not portray the anatomy of the birds described, are engravings. Some are taken from earlier authorities, some from unpublished pictures, notably those assembled in Leonhardt Baldner's *Vogel Fisch und Thierbuch*, purchased by Willughby and Ray on their European travels.

Case 6
ORNITHOLOGICAL WORKS (2)

The Owle
Michael Drayton
London: E. Whit and N. Ling, 1604
[S.L.] I [Drayton – 1604]

The Owle is an allegorical poem on the neglect shown to learning. It is included here to demonstrate the literary use of birds. The illustration on the title page is a woodcut.

Histoire Naturelle des Oiseaux, Vol. 3
Georges Louis Leclerc Buffon
Paris: Imprimerie Royale, 1770
96.d.3

This forms part of Buffon's famous 44-volume *Histoire Naturelle, Générale et Particulière*, which sums up the work of pre-Linnean natural historians. It was translated into various languages, and spread a taste for

natural history widely throughout Europe and North America. The illustrations are engraved.

A History of British Birds
Thomas Bewick
Newcastle: Beilby and Bewick, 1797
* 3.c.1

Thomas Bewick (1753-1828) showed a love both of nature and of drawing from an early age. He gave the woodcut a new lease of life by using the end grain of boxwood - which is very hard - instead of the plank, and tools similar to those used to engrave copper. Fine details can be shown. Bewick cut his own blocks from his own drawings. His birds, the wood engravings of which have never been surpassed, show evidence of very careful observation. Like Belon (see Case 5), Bewick shows birds in their habitats, but with a greater impression of life.

A General Synopsis of Birds
John Latham
London: White, 1781
V3 [Latham]

John Latham (1740-1837) was the pre-eminent ornithologist of his day. The text shown was later expanded into Latham's most famous work, *The General History of Birds* (1821-8). Latham's aim in *A General Synopsis* was to give 'a concise account of all the birds hitherto known'. He did all the etchings himself, and wrote of them: 'To each genus will be joined *one copper-plate at least*, of some new bird not figured before, if possible, for two reasons; the one to point out to the eye of the less-informed naturalist, wherein one genus differs from another; the other, to add somewhat to the stock of engravings in ornithology'.

A History of British Birds, Vol. 1
F.O. Morris
2nd edn
London: Bell, 1870
V3 [Morris]

This is the major work of many by Francis Orpen Morris (1810-1893) concerning natural history, religion and miscellaneous subjects. In the preface Morris lists his purposes for writing it as being to collect together,

as far as he could, all the known facts respecting the natural history of every British bird; to give correct and life-like figures of the several species; and to produce a readable book at a price affordable by every class. Morris produced the book in conjunction with Benjamin Fawcett and with the illustrator A.F. Lydon, originally one of Fawcett's apprentices. The illustrations were printed in colours from multiple wood blocks.

The Natural History of Pigeons
Prideaux Selby
Edinburgh: Lizars, 1835
[D.-L.L.] Vo [Jardine]

As a young teenager Selby (1788-1867) had already composed manuscript notes on the habits of the commoner British birds, illustrated with coloured drawings remarkable for the delicacy of their execution and their truthfulness to nature. He wrote *The Natural History of Pigeons* for William Jardine's *Naturalists' Library* (39 volumes, 1833-45), a useful series in its day which provided a popular scientific account of many vertebrates. Its coloured illustrations are from plates engraved by William Horne Lizars (1788-1859), who perfected a method of etching which performed all the functions of wood-engraving in connection with the illustration of books.

Case 7
BOTANICAL WORKS (1)

The Herball, or, Generall Historie of Plantes
John Gerard
London: J. Norton, 1597
[D.-L.L.] T^{o} [Gerard]

John Gerard's *Herball* is one of the best-known botanical books published in England and one of the longest-lived, contributing greatly towards knowledge of plants in England and still in use in the second half of the eighteenth century. While the text depends heavily on earlier printed sources, most notably Rembert Dodoens' *Stirpium Historiae Pemptades Sex* (1583), Gerard added (sometimes erroneous) English localities for plants, notes gained from personal experience and observations, and information obtained from friends and correspondents.

The several hundred English native flowering plants described and illustrated include approximately 182 not recorded in earlier works.

The illustrations are woodcuts, mostly printed from woodblocks which Norton, the publisher, obtained from Frankfurt am Main and which had been used in 1590 for Tabernaemontanus' *Eicones Plantarum*. Only about sixteen of the woodcuts are original (cf Case 1).

Canadensium Plantarum, Aliarumque Nondum Editarum Historia
Jacques Philippe Cornut
Paris: S. le Moyne, 1635
T4q.1 [Cornuti]

Jacques Philippe Cornut (1606-51) was a Paris physician with an interest in botany. His *Canadesium Plantarum ... Historia* is the first book on Canadian flora – and, incidentally, the first to illustrate poison ivy. Cornut did not himself travel to the new world, but received seeds and plants from those who did. The book looks at the properties and medicinal and social use of the plants concerned. It describes at least 30 previously unknown species. A century after compilation, Linnaeus consulted the work and cited several of its figures in the first edition of his *Species Plantarum*.

A Generic and Specific Description of British Plants
Carl Linnaeus
Kendal: T. Caslon et al., 1775
T4c [Linnaeus]

Botanical classification before 1735 was confused and inconsistent, rendering even such activities as ordering plants from nurserymen difficult. Carl Linnaeus (1707-1778) transformed it, and with it the entire science of botany, with his *Systema Naturae* (1735). The Linnaean system is based on the classification of plants and animals with two-word names, one denoting genus, the other, species. It rendered earlier florilegia based on no definite system of classification botanically out of date. Shown here is the first English translation of Linneaus's *Genera et Species Plantarum*. The *Species Plantarum* (1753) and the fifth edition of the *Genera Plantarum* (1754) were the starting point for the purposes of nomenclature of flowering plants and ferns.

Case 8
BOTANICAL WORKS (2)

English Botany, or, Coloured Figures of British Plants
James Sowerby
London: J. Sowerby, 1790
* T4c [Sowerby]

James Sowerby (1757-1822) was the first of a family of artists. He illustrated a large number of botanical works in addition to *English Botany*, including William Curtis's *Botanical Magazine* (see Case 3) and *Flora Londinensis*. James Edward Smith (1759-1828) supplied the text. Curtis regarded *English Botany* as a treacherous undertaking, rivalling the *Botanical Magazine*. *English Botany* ran from 1790 until 1814, contained 2,500 plates in its 267 parts, and was an instant success, primarily for its illustrations. It remains a valuable reference work, unsurpassed as an illustrated English flora.

An Abridgement of the* Flora Londinensis*, with Reduced Plates
William Curtis
[London]: W. Curtis, 1792
* T4c.1 [Curtis]

William Curtis's *Flora Londinensis*, acclaimed by botanists, described and illustrated all plants growing wild within ten miles of London. In the 70 parts issued 1775-8 were 434 plates drawn by Sydenham Edwards, James Sowerby, and William Kilburn. Curtis made the innovation of having specimens drawn life-size. *Flora Londinensis* was an expensive undertaking, and Curtis founded the *Botanical Magazine* (which the gardening public preferred; see Case 3) to help offset the cost of its production. The *Abridgement*, shown here, was undertaken to counteract Sowerby and Edward's supposed injury in starting *English Botany*. It was abandoned after five issues (36 plates). *Flora Londinensis* itself foundered in 1798.

English Wild Flowers to be Found by the Wayside, Fields, Hedgerows, Rivers, Moorlands, Meadows, Mountains, and Sea-Shore
Joseph Thomas Burgess
London: F. Warne, [1868]
FI Bur

Joseph Thomas Burgess (1828-1866) was an antiquary, a wood engraver, a landscape painter, a writer on widely varying subjects and a journalist. He prefaces *English Wild Flowers* by saying: 'I have tried to make this little volume worthy of being thought the indispensable companion of those who care to make the acquaintance of the flowers which blossom by the wayside, make gay our fields, haunt the brooks and streams, and stud alike with beauty the moorland and the mountain'. The work is one of many popular Victorian flower books intended to satisfy the amateur interest in natural history (see Case 4). In it Burgess argues for a new appreciation of the moral, aesthetic and scientific lessons which England's wild flowers can provide. The illustrations are chromolithographs.

Language of Flowers
Kate Greenaway
London: G. Routledge and Sons, [1884]
[S.L.] IV [Greenaway - 1884]

Kate Greenaway was one of the most popular figures in British book illustration in the latter part of the nineteenth century, and *Language of Flowers* has been considered her finest book. The first edition had a print run of 19,500. The symbolism associated with flowers from ancient times but lost in the eighteenth century revived in the nineteenth century with numerous books concerning the language of flowers. In the Greenaway specimen, text and illustrations bear little relationship with each other, in contrast with earlier emblem books (see Case 1). The printer was Edmund Evans (1826-1905), an entrepreneur of colour printing. He used four colour woodblocks (red, blue, yellow and flesh) to reproduce Greenaway's watercolours.

The Complete Flower Paintings & Drawings of Graham Stuart Thomas
Graham Stuart Thomas
London: Thames and Hudson, 1987
f VLeU THO

Graham Stuart Thomas (1909-2003) was Gardens Consultant to the National Trust. He wrote several books about gardens and plants, especially roses, and both horticulture and painting and drawing plants were among his recreations. Sir George Taylor, in the foreword to this book, desribes the author as 'in the elite of contemporary flower artists' and the purpose of the work as 'to record the author's joy in the beauty of flowers'.

Centre Case
MICROSCOPY

Optical magnification has a long history. In the first century AD, Seneca described how he used a globe of water to magnify small letters. However, it was the successful grinding of lenses from glass that made the simple microscope possible. This development probably began in the mid-fifteenth century, and culminated in the large and clear magnification achieved by the Dutch microscopist Antonie van Leewenhoek (1632-1723).

The idea of using more than one lens in combination to make a compound microscope occurred independently to several microscopists between 1590 and 1609, and the manufacture and use of these soon spread across Europe. In Britain, Robert Hooke (1635-1703) was at the forefront of microscopy. His papers to the Royal Society and his *Micrographica*, the first edition of which is shown, highlighted the usefulness of the microscope to the scientist.

The microscope was refined by various instrument makers in the succeeding centuries. John Cuff (1708-1772), who perfected the side-pillar, was one of the more important British makers. By the twentieth century, however, the compound microscope had reached the limit of its possible development.

In 1924, the French physicist Louis de Broglie (1892-1987) suggested that an electron beam might be used to magnify very small objects, since its wavelength was much smaller than that of light. The first electron microscope was built in 1933, and was soon developed to give extraordinary resolution.

The ability of the microscope to make visible things previously invisible to the naked eye captured the scientific and popular imagination. It led to a plethora of books for professional scientists, students, and amateurs. Perhaps the greatest botanical illustrator to work with the microscope was Franz (Francis) Bauer (1758-1840), elder brother of Ferdinand Bauer, the artist of *Flora Graeca* (see Wall Case). Born in Austria, he was a highly skilled botanist, and for 50 years worked on illustrations for the Royal Botanic Gardens at Kew.

Employment for the Microscope
Henry Baker
London: R. Dodsley, 1753
S3 [Baker]

Rust, Smut, Mildew, & Mould: An Introduction to the Study of Microscopic Fungi
M.C. Cooke; coloured figures by John E. Sowerby
London: Hardwicke and Bogue, 1878
H.P.L. [Cooke]

The Natural History of British Insects … Together with the History of Such Minute Insects as Require Investigation by the Microscope, Vol. I
Edward Donovan
London: F. and C. Rivington, 1802
* V2 [Donovan]

A Decade of Curious Insects … in Their Natural Size and as They Appear Enlarged before the Lucernal Microscope
John Hill
London: J. Hill, 1773
* V2 [Hill] fol

Micrographia, or, Some Physiological Descriptions on Minute Bodies Made by Magnifying Glasses
Robert Hooke
London: Royal Society, 1665
CNº [Hooke] SR

Micrographia Restaurata, or, The Copper-Plates of Dr Hooke's Wonderful Discoveries by the Microsope
Ed. by Henry Baker
London: J. Bowles, 1745
* f DW Hoo

Part of a Letter from Mr Anthony van Leeuwenhoek, F.R.S. concerning the Eyes of Beetles, &c., 9 May 1698
Philosophical Transactions of the Royal Society, Vol. 20
1698
PR Special Collections

Root Worm
Franz Bauer
[c. 1805]
Ms 1015

Coloured drawing of a wheat plant with magnified worms.

Wall Case
LARGE AND FINE NATURAL HISTORY BOOKS

Monograph of the Trogonidae, or Trogons, Pt. I
John Gould
London: J. Gould, 1858
Special Case, Folio Hall

The output of ornithologist John Gould (1804-1881) comprises an impressive 41 volumes, illustrated by 2,999 plates, in addition to approximately 300 memoirs and papers in the *Proceedings of the Zoological Society* and other scientific journals. Gould's best-known work is perhaps his *Birds of Australia* (7 volumes, 1840-48), for which he became known as the 'Audubon of Australia'. The work on trogons shown is a revised edition, with 11 extra plates, of a monograph published in 1835-8.

Illustrations were the main focus of Gould's work, and he devoted much care to the plates, showing creatures in their natural haunts. The hand-coloured lithographs of birds are life-size. The text is bound in with the

plates, unlike works such as Audubon's where text and plates are bound in separate volumes to enable lesser outlay by purchasing the text alone.

Flora Graeca, sive, Plantarum Rariorum Historia, quas in Provinciis aut Insulis Graeciae, Vol. 4
John Sibthorp
London: R. Taylor, 1823
* T4a [Sibthorp] Extra large fol.

The ten-volume *Flora Graeca* has been described as unquestionably the finest British illustrated botanical work resulting from foreign travel. It is one of just two works by John Sibthorp (1758-1796); the other (*Flora Oxoniensis*, 1794) enumerated 1200 species of flora which Sibthorp observed in Oxfordshire. *Flora Graeca* is based on a trip to Greece made 1794-5, and was published posthumously under the editorship of James Edward Smith (who complained about Sibthorp's illegible handwriting and the absence of annotations on his collections and drawings). The work contains 966 plates, drawn by Ferdinand Bauer and engraved by James Sowerby, and cost over £30,000 to produce. Only 30 complete copies were issued to subscribers, at a cost of 240 guineas per set. Sibthorp's estate financed the publication heavily, and publication would have ceased had not the British Museum lost a court case claiming its free copy by the laws of copyright.

De Europische Insecten
Maria Sibylla Merian
Amsterdam: J.F. Bernard, 1730
* V2 [Merian] Extra large folio

Maria Sibylla Merian (1647-1717) learned painting and engraving as a child from her stepfather, Jacob Marrel. Following a childhood interest in insects, she engraved 100 plates for *Der Raupen wunderbare Verwandlung und sonderbare Blumennahrung* (1679-83; shown here in Dutch translation) upon the urging of friends. Each plate shows caterpillars feeding. Merian was the first author to associate insects with their host plants in this way. She was also the first to illustrate the full metamorphoses of many species of butterflies and moths. While Merian's chief interest was insects, she also gained a reputation as a painter of flowers.

Metamorphosis Insectorum Surinamensium
Maria Sibylla Merian
Amsterdam: M.S. Merian, 1705
* V2 [Merian] Extra large folio

Merian travelled to Surinam (Dutch Guiana) at the age of 52 in 1699, financing her trip by selling her paintings and collection of insects, in order to study insects in their natural habitats. She remained there for 21 months, breeding, collecting and sketching insects. Merian financed the publication of her subsequent book on insects of Surinam herself, losing money on the venture. Two versions were published, one with the text in Latin (shown here), one in Dutch. Merian engraved three of the 60 plates, a team of three engravers the rest. They depict about 90 studies of caterpillars evolving into insects, mostly life-size, and include the names and local uses of plants. The engravings are the first extensive visual record of South American plants and insects and the first record at all of many of the subjects. Later editions add 12 more plates based on the drawings of Merian's elder daughter, Johanna.

Ichtylogie, ou Histoire Naturelle, Générale et Particulière des Poissons, Pt. I
Marcus Elieser Bloch
Berlin: M.E. Bloch and F. de la Garde, 1785
* V3 [Bloch] Extra large folio

Marcus (Marc) Bloch (c. 1723-1799), a physician in Berlin, was 56 years old when he began to write on ichthyological subjects. His first work, on German fish (1782-4), remained serviceable for a century. That on foreign fish (1785-1795), shown here, was ultimately less successful, being perforce based on the drawings and descriptions of others and on specimens of doubtful provenance rather than personal observation. Nevertheless, Bloch succeeded in his works in describing 1,519 species of fish. They are marked by full descriptions and by engraved illustrations of each species in a style magnificent for the time.

Historia Naturalis Ranarum Nostratium
August Johann Rösel von Rosenhof
Nuremberg: J.J. Fleischman, 1758
* V3 [Rösel von Rosenhof] Extra large folio

August Johann Rösel von Rosenhof (1705-1759) received his early training as an artist. Perusal of Merian's *Metamorphosis Insectorum Surinamensium* while ill in Hamburg in 1728 inspired him to do a similar study of German insects. From insects he proceeded to frogs as shown (1753-8). The great detail in which Rösel von Rosenhof's work describes the natural history of amphibians may entitle him to be called the father of herpetological natural history. The illustrations, considered the best pictures of frogs ever produced, have been duplicated ever since their first publication. Each of the 48 plates appears both in black and white with labels, for scientific clarity, and in colour without the labels, to satisfy the writer's artistic bent.

Gleanings of Natural History, Vols. 1 and 3
George Edwards
London: G. Edwards, 1758-1764
V [Edwards] fol. Strong Room

George Edwards (1694-1773) was famed for his coloured drawings of animals, especially birds. His three-volume *Gleanings of Natural History* supplements his *History of Birds* (1743-51). Between them, the two works contain engravings and descriptions of over 600 zoological subjects which had not previously been described or delineated. The bilingual French and English text is a fairly common solution to the problem of the absence of a single common scholarly language after Latin had passed out of general use.

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