



— THE NATURE OF —

Natural Science



An exhibition of books and archives in Special Collections

HAND-LIST OF ITEMS & COLLECTIONS EXHIBITED

Kent State University Libraries
Kent, Ohio





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An exhibition of books and archives in Special Collections

— *Curated by* —
Kathleen Siebert Medicus
and Cara Gilgenbach

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Dedication

This exhibition is dedicated to the memory of Jeffery C. Moore (1981-2010), a respected colleague in the University Libraries for several years who served most recently as Special Collections Associate in the Department of Special Collections and Archives.

The Nature of Natural Science

Introductory Note

The Nature of Natural Science includes some of the most significant holdings in the history of science held by the Kent State University Libraries' Department of Special Collections and Archives. From medicine to astronomy to the natural history of Ohio, these 16th to 20th century books and manuscripts trace the progress of the scientific revolution and record pivotal moments in the history of human knowledge. The exhibition is comprised of ten divisions, providing a sweeping overview of key scientific publications and noting some of the important connections among these works.

The exhibition also seeks to provide a more individual, localized experience of science through the personal manuscripts and publications of selected amateur naturalists of Ohio. While the history of science and technology is very much about big ideas and breakthroughs, it is also about a multitude of individuals dedicating countless hours to observation and exploration. Many of these individuals, including amateurs, have contributed to the mapping, categorization, and description of the natural world.

The books on exhibit have been highly valued for the information they contain, but they are also an important testament to the history of printing and publication in the West. Many of these books feature highly detailed illustrations and some are beautifully hand-colored. Several others include complicated fold-outs bound into the volume featuring diagrams, astronomical charts, maps, and other large illustrations. The exhibit also includes examples of the art of natural history illustration, ranging from the work of prominent illustrators such as John James Audubon to little-known amateur artists of exceptional skill level.

The curators wish to thank the University Libraries Communications Office, particularly Diane Sperko and Allan Kneale for their production and design work. We also thank Special Collections undergraduate student assistant Larissa Thompson for her assistance in display preparation.

Kathleen Siebert Medicus
Cara Gilgenbach
2011



ITEMS &
COLLECTIONS
EXHIBITED



SCIENTIFIC METHOD



ASTRONOMY & PHYSICS



GEOLOGY



DARWIN &
EVOLUTIONARY THEORY



CHEMISTRY



MEDICINE



BOTANY



ORNITHOLOGY



NATURAL HISTORY
ARTISTS



OHIO NATURALISTS



SCIENTIFIC METHOD

- 1 Francis Bacon, 1561-1626. *Of the Advancement and Proficiency of Learning...* Oxford: Young & Forrest, 1640.

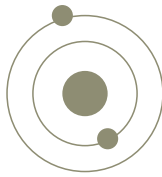
An English statesman, essayist, philosopher, and lawyer, Bacon has been called the father of empiricism. His works established and popularized methodologies for scientific inquiry, often called the scientific method.

- 2 Denis Diderot, 1713-1784 and Jean Le Rond d'Alembert, 1717-1783. *Encyclopedie, ou, Dictionnaire raisonné des sciences...* (vol. 1 of 17). À Livourne: De l'Imprimerie des éditeurs, 1770-1774.

This great French encyclopedia is considered a monument in the history of European thought and a permanent source for all aspects of 18th-century civilization, including scientific and mathematical knowledge.

- 3 John Locke, 1632-1704. *The Works of John Locke*. Fourth edition. London: Printed for Edmund Parker [and others], 1740.

John Locke is considered to be one of the first of the British empiricists and also one of the most influential Enlightenment thinkers. This three-volume edition of his collected works includes his famous *Essay Concerning Human Understanding* in which he proposed to “enquire into the original certainty and extent of human knowledge.”



ASTRONOMY & PHYSICS

- 4 Johannes Kepler, 1571-1630 and Tycho Brahe, 1546-1601. *Tabulae Rudolphinae...* [Rudolphine Tables]. Ulmae: Jonae Saurii, 1627.

The Rudolphine Tables were named in honor of Emperor Rudolph II, who sponsored the work, and consist of a star catalogue and planetary tables published by Johannes Kepler using data from observations made by Tycho Brahe, with whom he had collaborated for many years on the project but who died unexpectedly before the publication.

- 5 Pierre Gassendi, 1592-1655. *Institutio Astronomica...* Londini: Typis Jacobi Flesher, 1653.

A French philosopher, priest, astronomer, and mathematician, Gassendi was also an active observational scientist and became the first person to observe the transit of a planet across the sun, viewing the transit of Mercury that Kepler had predicted.

- 6 David Gregory, 1659-1708. *Astronomiae, Physicae & Geometricae Elementa*. Oxoniae: E Theatro Sheldoniano, 1702.

A Scottish mathematician and astronomer, David Gregory was professor of mathematics at the University of Edinburgh. He left for London in 1691 where he was introduced to Isaac Newton. He is most famous for this volume, which is the first textbook on gravitational principles.

- 7 Duncan Bradford, d. 1887. *The Wonders of the Heavens, Being a Popular View of Astronomy...* Boston: American Stationers Company, 1837.

This example of a work of popular astronomy presents a compilation of information from several important astronomy books.



GEOLOGY

- 8 Georg Agricola, 1494-1555. *De Re Metallica...* Basileae: Sumptibus & Typis Emanuelis König, 1657.

Agricola had studied at Leipzig, Bologna, and Padua and was a physician. Living in mining regions all his life made it possible for him to study mining practices first hand and these direct observations made his books particularly valuable and effective. This is his best known work and is considered to be the first technological book of modern times.

- 9 Athanasius Kircher, 1602-1680. *Mundus Subterraneus...* Amstelodami: Apud Joannem Janssonium, 1678.

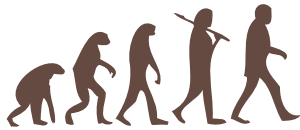
Kircher was a 17th-century German Jesuit scholar who published around forty works, most notably in the fields of Asian studies, medicine, and geology. His geological and geographical investigations culminated in the publication of this volume.

- 10 Louis Agassiz, 1807-1873. *Études sur les glaciers*. Neuchatel: Jent et Gassmann, 1840.

Agassiz, a Swiss naturalist, is considered to be the founder of glacial geology. His work was based on extensive observations made on glaciers and the great moraines of the Rhone Valley.

- 11 Sir Charles Lyell, 1797-1875. *Principles of Geology, Being an Attempt to Explain the Former Changes of the Earth's Surface, by Reference to Causes Now in Operation*. (3 vols.) London: John Murray, 1830-1833.

This work is considered a classic by the “father of modern geology.”



DARWIN & EVOLUTIONARY THEORY

- 12 Charles Darwin, 1809-1882. *Journal of Researches into the Natural History and Geology of the Countries Visited During the Voyage of H.M.S. Beagle Round the World...* First American edition. New-York: Harper & Brothers, 1846.

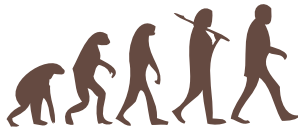
The first book Charles Darwin published, this vivid and exciting travel memoir made him a popular author. It is also a detailed scientific field journal that demonstrates his keen powers of observation and illustrates his changing ideas as he was beginning to develop the theory of evolution by natural selection.

- 13 Charles Darwin, 1809-1882. *On the Origin of Species by Means of Natural Selection*. First edition, first issue. London: John Murray, 1859.

The most influential scientific work of the 19th century, Darwin's first publication of his theory of evolution aroused worldwide criticism and controversy, both religious and scientific. This is a rare copy of the first issue of the first edition.

- 14 Charles Darwin, 1809-1882. *On the Origin of Species by Means of Natural Selection*. First American edition. New York: D. Appleton and Company, 1860.

The first American edition of Darwin's publication on his theory of evolution.



DARWIN & EVOLUTIONARY THEORY

- 15** Charles Darwin, 1809-1882. *The Descent of Man and Selection in Relation to Sex*. Revised edition. Chicago: Rand, McNally & Company, 1874.

Darwin's second great book on evolutionary theory. Here, he applies evolutionary theory to human evolution, and details his theory of sexual selection.

- 16** Charles Darwin, 1809-1882. *The Variation of Animals and Plants Under Domestication*. First American edition. New York: Orange Judd & Company, 1868.

This book includes a lengthy and highly detailed exploration of the mechanisms of variation at work in a number of species of domesticated animals.



CHEMISTRY

- 17 Joseph Priestley, 1733-1804. *Experiments and Observations on Different Kinds of Air*. Third edition, corrected. London: Printed for J. Johnson, 1781.

Priestley was an 18th-century English theologian, clergyman, natural philosopher, educator, and political theorist who published over 150 works. This is his most important scientific work; it outlines his famous experiments, including his description of oxygen and some of its properties.

- 18 Robert Boyle, 1627-1691. *The Works of the Honourable Robert Boyle*. (5 vols.) First collected edition. London: Printed for A. Millar, 1744.

Robert Boyle was a natural philosopher, chemist, physicist, and inventor, who is also noted for his writings in theology. He is largely regarded today as the first modern chemist and one of the founders of modern chemistry.

- 19 Herman Boerhaave, 1668-1738. *A New Method of Chemistry, Including the History, Theory, and Practice of the Art*. Third edition, corrected. London: Printed for T. and T. Longman, 1753.

Boerhaave was a professor of medicine, botany, and chemistry at the University of Leiden. He is best known for his medical work and is regarded as the founder of clinical teaching and of the modern academic hospital, but he also published a famous chemical textbook, *Elementa Chemiae*, here translated into English.



MEDICINE

- 20 Galen, circa 129-199 A.D. *Opera omnia...* (2 vols.) Basileae: Apud Ioan. Hervagium et Ioan. Erasmium Frobenium, 1538.

Galen was the most prolific of the ancient medical writers and left a vast medical encyclopedia, considered to be the “Bible” of classical medicine. This is the second printed collection of Galen’s works in Greek, the first having been published by Aldus in 1525.

- 21 Dioscorides Pedanius, of Anazarbos, circa 40-90 A.D. *Libri Octo Graece et Latine* [Eight books in Greek and Latin]. Parisiis: Imprensus Viduae Arnoldi Birkmanni, 1549.

Dioscorides was a Greek pharmacologist, botanist, and physician who practiced in Rome at the time of Nero. This work, also titled *Materia Medica* in Latin, is an encyclopedia about herbal medicine and related medicinal substances.

- 22 Aulus Cornelius Celsus, fl. 25 A.D. *De Medicina...* Lugduni Batavorum: Apud Salomonem Wagenaer, 1665.

The oldest Western medical document after the Hippocratic writings and the earliest Western history of medicine, the text gives an account of the whole of known medicine and surgery.



MEDICINE

- 23 Erasmus Darwin, 1731-1802. *Zoonomia, or, The Laws of Organic Life*. (2 vols.) London: Printed for J. Johnson, 1794-1796.

Erasmus Darwin was an English physician, one of the key thinkers of the Midlands Enlightenment, and also a natural philosopher, physiologist, abolitionist, inventor, and poet. *Zoonomia* is his most important scientific work and it contains a detailed system of pathology.

- 24 Florence Nightingale, 1820-1910. *Notes on Nursing: What It Is, and What It Is Not*. First American edition. New York: D. Appleton and Company, 1860.

Florence Nightingale became a national heroine as the result of her work in the hospitals of the Crimean War, introducing sanitary measures and patient comforts to drastically reduce the mortality rate among British troops. This book represents the first major work on the subject of nursing and remained influential for many years.



BOTANY

- 25** Rembert Dodoens, 1517-1585. *A Nieuwe Herball, or, Historie of Plantes*. First English edition. Antwerpe: Imprinted by Henry Lowe to be sold at London by Gerard Dewes, 1578.

Rembert Dodoens was a Flemish physician and botanist and a professor of medicine at the University of Leiden. This herbal was first published in 1554 (in Dutch) and it includes over 700 illustrations.

- 26** Rembert Dodoens, 1517-1585. *Stirpium Historiae...* Antverpiae: Apud Balthasarem et Ioannem Moretos, 1616.

An early 17th-century copy of Dodoens' herbal translated into Latin.

- 27** Nehemiah Grew, 1641-1712. *The Anatomy of Plants...* London: Printed by W. Rawlins for the author, 1682.

Nehemiah Grew was a British plant anatomist and physiologist, and was famously known as the "father of plant physiology." This is the first edition of what is considered to be his great work, and it is especially notable for its descriptions of plant structure.

- 28** Stephen Hales, 1677-1761. *Vegetable Staticks, or, An Account of some Statical Experiments on the Sap in Vegetables...* London: Printed for W. and J. Innys and T. Woodward, 1727.

Stephen Hales was a parson who was also a physiologist, chemist, and an inventor. He studied the role of air and water in the maintenance of both plant and animal life. In this first volume of his published experiments, he recorded accurate accounts of the movements of water in plants and demonstrated that plants absorb air.



BOTANY

- 29** William Woodville, 1752-1805. *Medical Botany, Containing Systematic and General Descriptions...of all the Medicinal Plants...of the Materia Medica.* (2 vols.) Second edition. London: Printed and sold by William Phillips, 1810.

William Woodville was an English physician and botanist who had been an apprentice to an apothecary. *Medical Botany* was first published from 1790 to 1794 and was intended to update and supplement Dioscorides' classic *Materia Medica*.

- 30** Walter Hood Fitch, 1817-1892, illustrator and William Rhind, 1797-1864. *A History of the Vegetable Kingdom...* Glasgow: Blackie and Son, 1855.

William Rhind was a prominent Victorian botanist, a physician, and the author of numerous books on natural history and related subjects. *A History of the Vegetable Kingdom* is the work for which he is best remembered today. It is also notable for its elaborate illustrations by one of the most important botanical artists of the 19th century, Walter Hood Fitch.



ORNITHOLOGY

- 31** Alexander Wilson, 1766-1813. *American Ornithology, or, The Natural History of the Birds of the United States*. (3 vols.) London: Whittaker, Treacher & Arnot; Edinburgh: Stirling & Kenney, 1832.

Born in Scotland, Wilson emigrated to the United States in 1794 where he developed his interest in ornithology. He traveled widely in order to observe and draw birds and collect subscribers for his book. Originally issued in nine volumes between 1808-1814, *American Ornithology* illustrates 268 species of birds, 26 of which were identified for the first time. Wilson is now regarded as the greatest American ornithologist prior to Audubon.

- 32** Charles Lucian Bonaparte, 1803-1857. *American Ornithology, or, The Natural History of Birds Inhabiting the United States, not given by Wilson*. (4 vols.) Philadelphia: Samuel Augustus Mitchell, 1825-1828.

Charles Bonaparte was an extremely competent and prolific natural scientist in Europe. In 1822, he began studying the ornithology of the United States and updating Wilson's *Ornithology*. This is the first edition of his continuation of and supplement to Wilson's work.

- 33** Thomas Bewick, 1753-1828. *A History of British Birds*. Sixth edition. Newcastle: Printed by Edw. Walker for T. Bewick, 1826.

Thomas Bewick was an English artist and ornithologist. He is considered to be the finest of the British wood engravers and developed techniques that became the dominant method used.



ORNITHOLOGY

- 34 Genevieve Estelle Jones, 1847-1879, Eliza J. Schulze, 1847-1920?, and Virginia Smith Jones, 1826-1906. *Illustrations of the Nests and Eggs of Birds of Ohio*. Circleville, Ohio, 1886 (Printed in Cincinnati by Robert Clarke).

Illustrations of the Nests and Eggs of Birds of Ohio was published in the small town of Circleville, Ohio, over a period of eight years (from 1879 to 1886) through the dedicated efforts of the family and friends of Genevieve Jones (who had begun the work with Eliza Schulze, but died at a young age, before its completion). It was produced not only by amateur scientists but largely by women, far from the publishing houses and intellectual centers of 19th-century America, and was hailed as an extraordinary achievement.



NATURAL HISTORY

ARTISTS

- 35** John Gould, 1804-1881. Four plates from *A Monograph of the Trochilidae, or Family of Humming-Birds*. London, 1849-1880.

John Gould was an English ornithologist and bird artist with a strong interest in hummingbirds. His identification of the birds now nicknamed “Darwin’s finches” played a role in the inception of Darwin’s theory of evolution by natural selection.

- 36** John James Audubon, 1785-1851 and John Woodhouse Audubon, 1812-1862. Seven plates from *The Viviparous Quadrupeds of North America*. New York: J. J. Audubon, 1845-1848.

Audubon was a French-American ornithologist, naturalist, hunter, and painter. His meeting with the ornithologist Alexander Wilson in Kentucky in 1810 inspired him to begin a study of birds. These plates are from the final work of his career, a book on mammals prepared in collaboration with his sons and with his friend John Bachman. Two of the illustrations on display were drawn by Audubon’s son, John Woodhouse Audubon.



OHIO NATURALISTS

37 George Jason Streator, 1843 or 1846-1925. Papers.

The exhibition includes a selection of items from the George Jason Streator papers. Streator was a Portage County, Ohio, nurseryman and amateur naturalist with a special interest in conchology and fresh water mollusks. Streator was also active in local scientific societies, organizing lecture series and other meetings of naturalists and specimen collectors in Portage County.

Also exhibited with the Streator materials are popular 19th-century handbooks in conchology:

Captain Thomas Brown, 1785-1862. *The Conchologist's Text-book, Embracing the Arrangements of Lamarck and Linnaeus, with a Glossary of Technical Terms...* Fourth edition. Glasgow: Archiblad Fullarton & Co., 1837.

Edgar Allan Poe, 1809-1849. *The Conchologist's First Book: or, A System of Testaceous Malacology, Arranged Expressly For the Use of Schools...* First edition. Philadelphia: Published for the author, by Haswell, Barrington, and Haswell, 1839. (Issues a and b of this work are exhibited.)

38 Raymond C. Rush, 1875-1954. Papers.

The exhibition includes a selection of items from the Raymond C. Rush papers. Rush was a medical doctor based in Hudson, Ohio, who was an amateur naturalist and later in life a nursery owner specializing in rare conifers. As a collector, Rush was particularly interested in mollusks, but his journals also include observations of many other aspects of nature including birds and their nests, amphibians, insects, and local geology.

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