

@ the Library •
Darwin



Voyager
Geologist
Species Theorist
Botanist

An Exhibition of Darwin First Editions

HISTORY OF SCIENCE COLLECTIONS
UNIVERSITY OF OKLAHOMA LIBRARIES

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Welcome to the *Darwin@the Library* exhibition

The History of Science Collections of the University of Oklahoma Libraries is recognized around the world as one of the premier research collections in its field. Its holdings offer scholars countless opportunities for investigation and discovery. Rare treasures like the ones described here will be appreciated for generations to come.

For a special collection to remain a living library, it must continue to grow. Only a few years ago, with the acquisition of the *Zoology of the Voyage of H.M.S. Beagle* (1838-1843), the Collections completed its set of Darwin first editions. The *Zoology*, the first and rarest of Darwin's works, became a centerpiece of *Darwin@the Museum*, a joint exhibition with the Sam Noble Oklahoma Museum of Natural History throughout the fall of 2009 in which all of Darwin's first editions were displayed for public viewing. With this *Darwin@the Library* brochure and the accompanying special exhibition, we are pleased to again make the Darwin holdings available to the public.



Darwin, *Zoology of the Beagle* (1838-1843)

The Darwin collection illustrates the capacity of the History of Science Collections to support research: in addition to all of Darwin's works in their first editions, it consists of several autograph letters and hundreds of subsequent editions and translations including such unusual works as the *Descent of Man* in Yiddish (1928). These rare works, along with current studies of Darwin, are all shelved together in the Collections to facilitate research in the University of Oklahoma Libraries and beyond.

Sul Lee
Dean, University Libraries
Peggy V. Helmerich Chair

University of Oklahoma Libraries

The University of Oklahoma Libraries on the Norman, Oklahoma City and Tulsa campuses is the largest research library in the state of Oklahoma, containing more than 5 million volumes. OU Libraries ranks in the top two in the Big 12, and 27th out of 113 research libraries in North America for volumes held. OU students, faculty and staff have access to 13 distinct libraries and collections that feature more than 17,000 linear feet of manuscripts and archives. Additionally, OU Libraries has more than 1.6 million photographs, subscribes to more than 63,000 periodicals, provides access to more than 250 electronic databases, and holds more than 70 incunabula (books printed in the 15th century). OU Libraries is a depository of federal, state and European Union government documents. Many of these resources are available to visitors to OU as well as students engaged in distance learning. Digital resources available include *Sooner Magazine*, the minutes of the OU Board of Regents and several Native American-related collections may be viewed at *digital.libraries.ou.edu*. OU Libraries is just one of the ways in which the university serves as a pacesetter for education in the state. For library hours and information, please call (405) 325-4142 or email a librarian at *librarian@ou.edu*.

For more information about the History of Science Collections, call (405) 325-2741 or view the Collections website at *libraries.ou.edu*.

Bibliographic note

For the sake of readability, citations are abbreviated in the following book descriptions. Titles are shortened and the publisher is omitted. With the exception of the *Zoology of the Voyage of H.M.S. Beagle*, all Darwin first editions were published in London by John Murray. An exact description for each title can be found using the indicated Freeman number (F#), which refers to its entry in the Freeman Bibliography, the standard description for Darwin editions. The Freeman Bibliography is available at the *Darwin Online* project of Cambridge University.

Introduction

While nearly everyone has heard of Charles Darwin's *Origin of Species*, not everyone is aware of the beauty and breadth of Darwin's works. In his own lifetime, Darwin was known as a voyager, geologist, species theorist and botanist. Darwin's reputation as a scientist rested upon his observational skills and his theoretical vision. Yet no scientist works in isolation, and Darwin spent much of his time writing. Darwin engaged in lengthy correspondence with scientists around the world, requesting and receiving observations from others, and presenting his ideas in letters before advancing them more definitively in print. Darwin's prodigious correspondence contributed greatly to his productivity as an author.

Darwin was a tireless writer who penned an estimated 15,000 letters, authored more than 200 articles and published 22 printed volumes (not including his posthumously-published *Autobiography*). Most of the printed volumes went through multiple editions and translations. Few persons ever experience the opportunity to view first editions of Darwin's printed volumes together at once. As you do so in this *Darwin@the Library* exhibit, we invite you to gain a renewed sense of the beauty of nature, the beauty of old books, and the breadth of Darwin's contributions to natural science.

Darwin wrote about a staggering number of topics in a wide variety of fields, drawing them together in a comprehensive vision of remarkable depth and originality. His books are beautiful examples of 19th-century natural science.



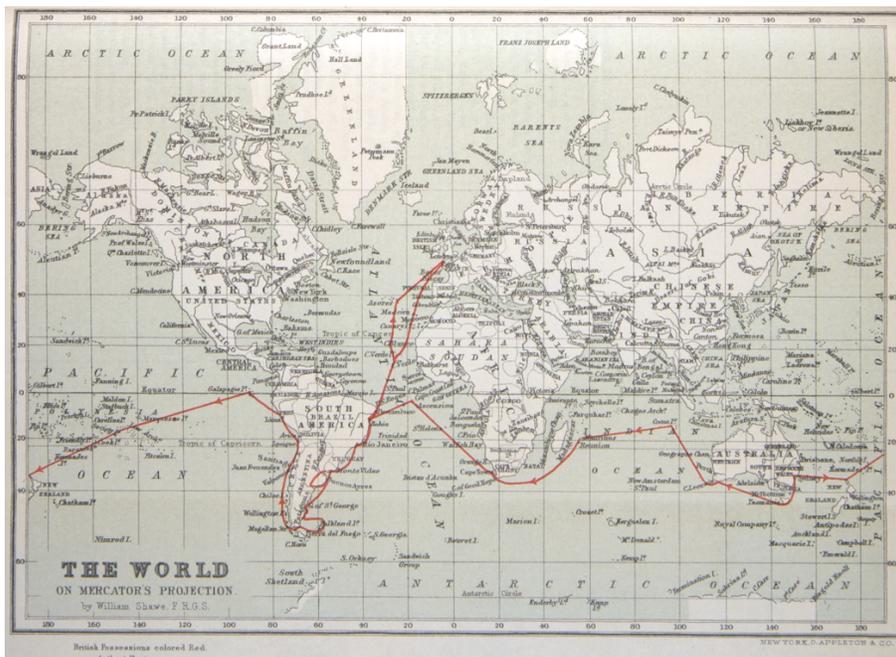
Voyager

H.M.S. Beagle, 1831–1836

The first books Darwin published resulted from his voyage on H.M.S. Beagle, which sailed around the world from 1831 to 1836. The chief mission of the voyage was to explore the southern portions of South America.

The Beagle model on display was acquired by the Sam Noble Oklahoma Museum of Natural History for *Darwin@the Museum*, a joint exhibition held in fall 2009. Through the generosity of the Museum, the ship is now on indefinite loan to the History of Science Collections.

The original H.M.S. Beagle was built as a 10-gun brig, almost exactly as long and as wide as the combined Roller Reading Room, Exhibit Lobby and Elevator Foyer of the History of Science Collections (approximately 100 x 25 feet). It set sail on its second surveying voyage in 1831, captained by Robert Fitzroy with more than 35 sailors aboard. A 22-year-old naturalist named Charles Darwin joined the expedition and made it the most noteworthy voyage of exploration of the 19th century.



Zoology of the Voyage of H.M.S. Beagle, 3 vols. (1838-1843); F8

In the *Zoology*, Darwin described the specimens he collected and sent back to England during the voyage. The *Zoology* is the rarest of all Darwin's works, issued in 19 separate parts from 1838 to 1843, with half of its 180 lithographs colored by hand. The OU copy is bound in three volumes; no page or plate is missing.

Although Darwin edited and superintended the work, he was a young man and not well known to the British scientific scene, so he enlisted five elite and well-respected naturalists to collaborate with him.

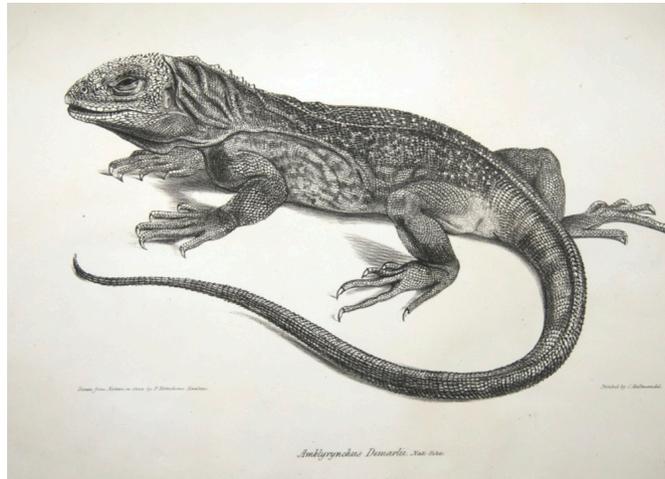
In Part 1, Richard Owen assisted in describing South American fossil mammals. Detailed engravings include a fold-out actual-size depiction of the skull of the prehistoric *Toxodon* mammal.

George Waterhouse assisted with living mammal specimens in Part 2. South American foxes, wild cats and aquatic mammals are portrayed alongside various species of field mice and larger rodents.

Part 3 is devoted to birds. For these specimens, Darwin obtained the help of John Gould, the great English ornithologist and artist. This volume is one of Gould's most famous works of art. Each lithograph was printed in black and white and then painstakingly hand-colored by John Gould and his wife, Elizabeth. The illustrations capture the immense variation found among species of mockingbirds and finches, and provide glimpses of species' natural habitats based upon Darwin's notes.



Part 4 is devoted to fish and Part 5 covers reptiles. Lizards from the Galapagos Islands are depicted, along with South American frogs and toads. Surprisingly, there is no description of a Galapagos tortoise.



Had Darwin never written another word, he would still be famous as the supervising author of the *Zoology*, a magnificent work of color natural history illustration. The *Zoology* brought Darwin to the attention of scientists everywhere as one of Britain's up-and-coming young naturalists.

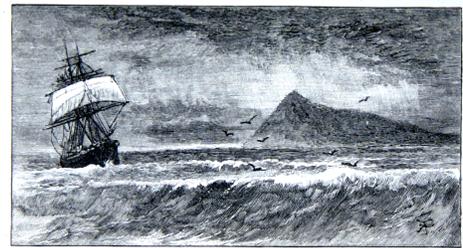


Journal of Researches, 1839; F11

Darwin's second book was a popular travel narrative, a lively account of the Beagle voyage originally published in 1839 as the third volume of the *Journal of Researches*, a four-volume report of the voyage by Robert Fitzroy, captain of *H.M.S. Beagle*. Darwin's journal became known in subsequent editions simply as the *Voyage of H.M.S. Beagle*. Darwin's *Voyage* was an immediate best-seller. More people read this book in the 19th century than any of Darwin's other works.



Darwin recounted adventures at sea such as going around Cape Horn, and adventures on land, crossing icy bridges in the Andes and treacherous mountain passages. He relayed visions of strange, far-away places and the exotic people who lived there. Darwin's travel narrative was widely admired, both in Britain and on the continent, as a description of the scientist as an explorer encountering the exotic and sublime.

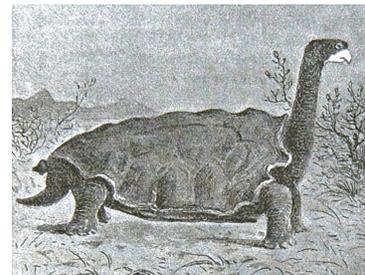


CAPE HORN (ANOTHER VIEW).

The *Voyage* makes compelling reading, with stories about many of the specimens described in the *Zoology*. For example, the *Voyage* explains that Darwin caught the vampire bat beautifully colored in the *Zoology* (previous page) as it alighted on the back of his horse near Coquimbo, in Chile.



The 1890 edition of the *Voyage* depicted the Galapagos tortoise, which somehow escaped being described in the *Zoology*. It's no wonder the *Voyage of the Beagle* has remained in print to this day.



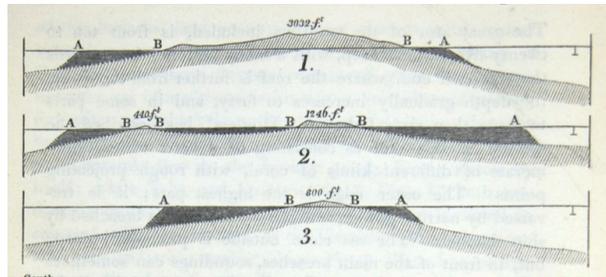
Geologist

On the heels of the Beagle voyage, the magnificent *Zoology of the Beagle* drew attention to Darwin as a promising young scientist, while at the same time the travel narrative made him well-known to the public. But Darwin established his reputation as one of the scientific elite with three substantial books on geology.

Coral Reefs, 1842; F271

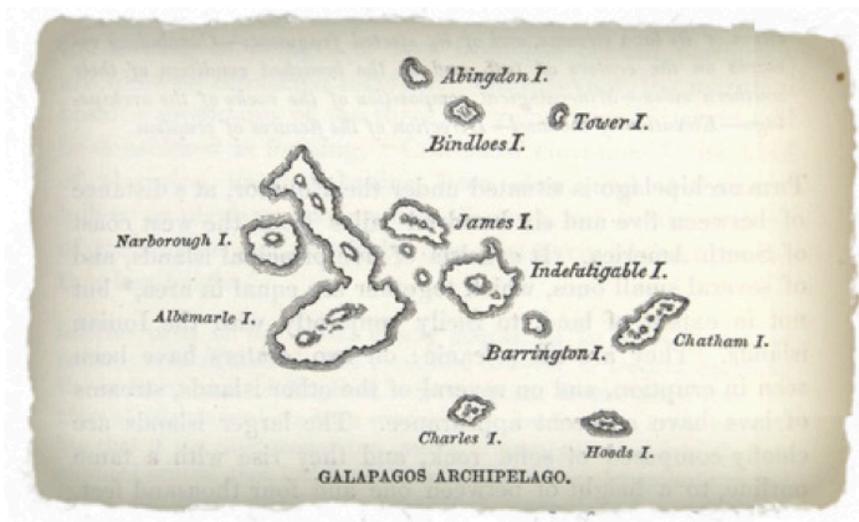
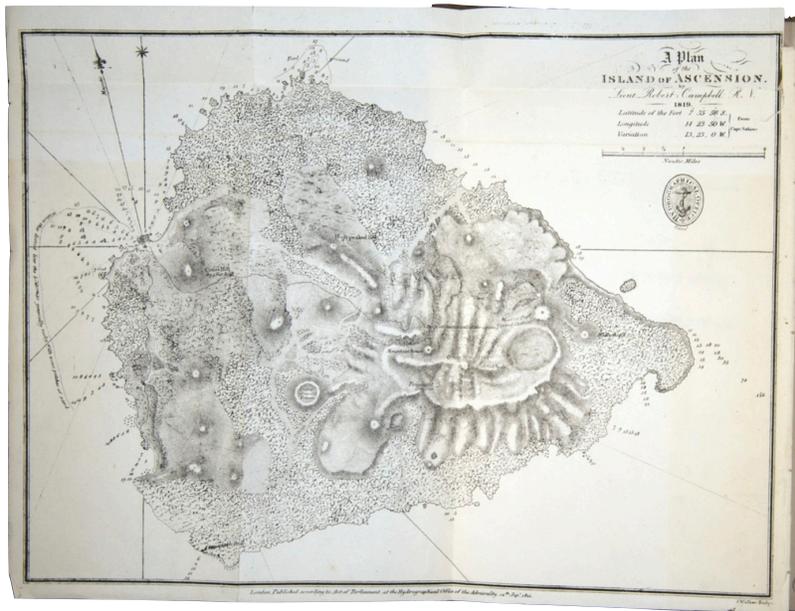
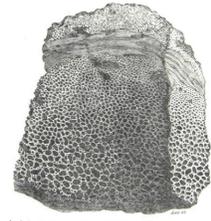
First came his study of coral reefs in 1842. During the Beagle voyage, Darwin visited many coral reefs. He compiled reliable observations of additional sites through personal correspondence and the published literature.

Coral reefs typically surround a volcanic island in a protective ring, creating a lagoon of quiet water within the reef. Darwin explained coral reefs as the cumulative result of small and gradual changes. He would follow the same methodology in his thinking about the history of life on Earth. At the time, Darwin's explanation of the gradual origin of coral reefs was hailed as a major advance in geology, and it is still accepted today.



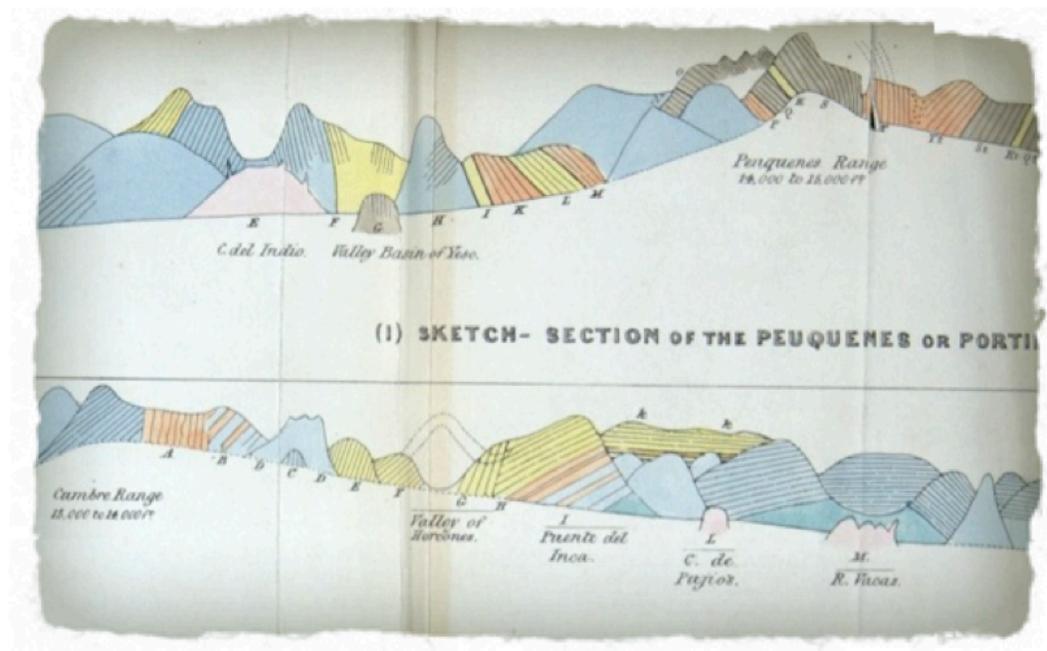
Volcanic Islands, 1844; F272

Next came Darwin's study of volcanic islands in 1844. He gave pride of place to his description of Ascension Island. He observed volcanic bombs, including one the size of a man's head. And he described the Galapagos Archipelago, where his observations later proved fertile for his theory of evolution.



Geological Observations on South America, 1846; F273

In 1846 Darwin published his geology of South America, the result of extensive fieldwork he undertook during the Beagle's explorations there. Because of the many excursions ashore, Darwin actually spent more time on land than aboard ship during the Beagle's voyage. To explain the geological features of South America, Darwin again argued for the significance of small and gradual changes. Had Darwin never written another word, he would still be remembered as a leading 19th-century geologist.



Species Theorist

After Darwin's emergence as a popular writer and a leading geologist, he turned to some thoughts that had been nagging him about species change. Darwin would devote the next decade to theorizing about the evolution of species.

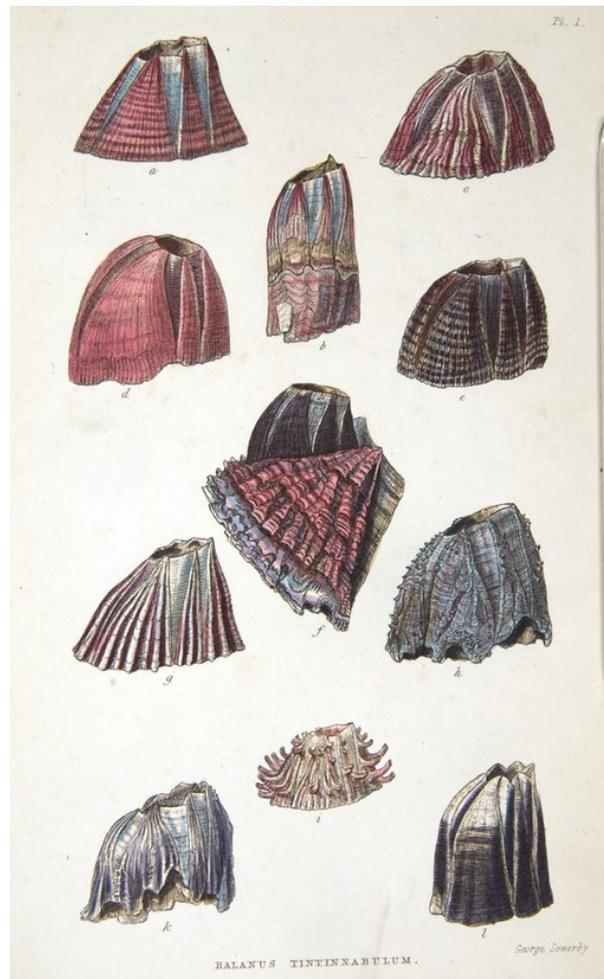
Monograph on Lepadidae, 1851

Monograph on Balanidae, 1854

Darwin began with an eight-year investigation of barnacles. In 1851 and 1854 Darwin published two monographs on barnacles containing page after page of depictions of both living and fossil forms.

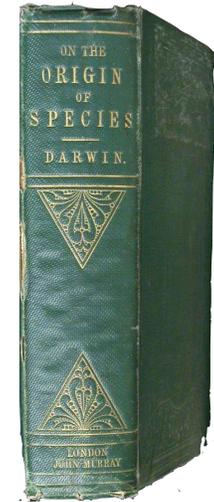
It may seem strange that after launching his career as a global voyager, Darwin then retreated into his study to spend eight years preoccupied with barnacles! Yet scrupulous study of barnacle variation provided him with an ideal laboratory to forge his ideas about species change.

Barnacles were simply a way of life in these long years for Darwin and his growing family. When Darwin's young son visited a friend and saw no evidence of dissections in the house, he asked, "Where does *your* Daddy do *his* barnacles?"



On the Origin of Species by Means of Natural Selection, 1859; F373

After refining his ideas about species change in the special case of barnacles, in 1859 Darwin published a general account of his theory of descent with modification by means of natural selection. Contemporaries referred to the origin of species as that “mystery of mysteries.” Darwin appreciated the complex relations of any species with its environment, and clarified how it is that some varieties have greater success than others in leaving offspring. Varying conditions of life cause organisms with particular variations to survive — this is natural selection.



If you have an old copy of the *Origin of Species*, turn to page 20 and count down to the 11th line. If “speceies” is misspelled, then you have a first edition.

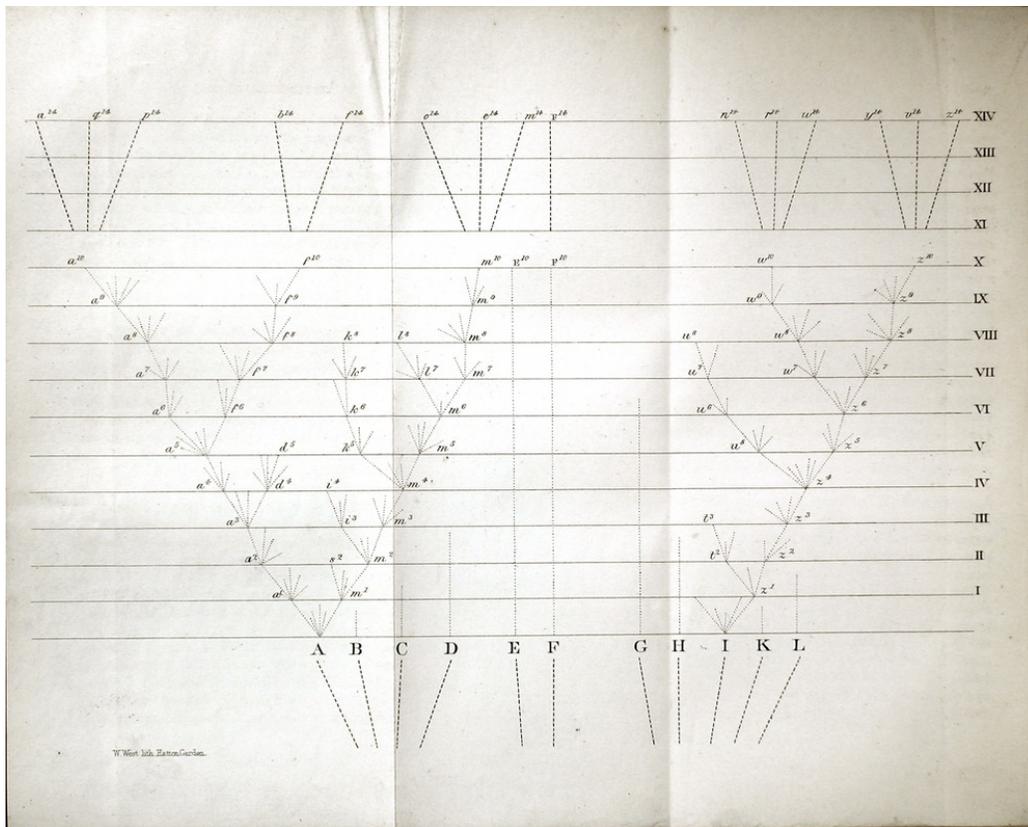
In the first chapter, Darwin demonstrated the vast extent of variation among domesticated species. As a result of human selection in breeding, dogs and pigeons and other animals have undergone remarkable changes.

In chapter 2, Darwin explored the extent of variation of animals under natural conditions, apart from human selection. To explain the concepts of “the struggle for existence” and “natural selection,” in chapters 3 and 4 Darwin elucidated the complex relations between closely related species and their habitats in order to explore how natural conditions might exercise a similar effect as human selection. Darwin argued that the process of species change remained wrapped in obscurity because of the complexity of these relations. Therefore Darwin patiently accumulated accounts of animal relations, elucidating far-reaching connections, with careful attention to detail. One of Darwin’s favorite stories is mentioned on p. 74, where he wrote that “*The number of humble-bees in any district depends in a great degree on the number of field mice, which destroy their combs and nests....*” As it was elsewhere elaborated: The humble bee pollinates the most desirable variety of clover, but because the bee builds its nests on the ground, a certain

species of field mouse destroys the humble bee's nests. The clover is used to make the best quality hay, which is used to feed the best horses of the British cavalry. The British cavalry enforces British power in the colonies. Because cats eat mice, and old ladies keep cats, the continuance of the British empire therefore obviously depends upon a bountiful supply of old ladies!

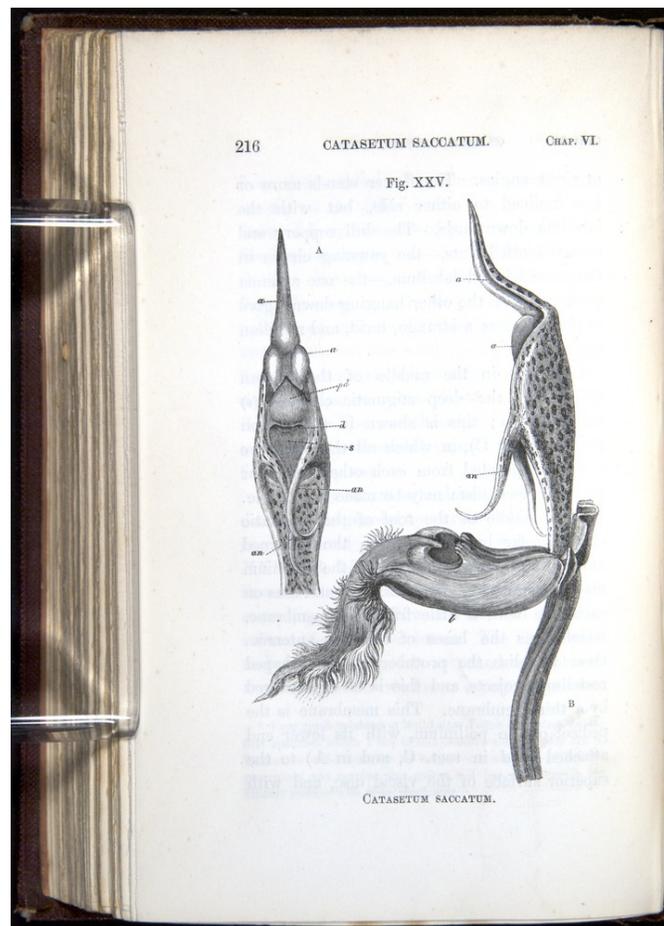
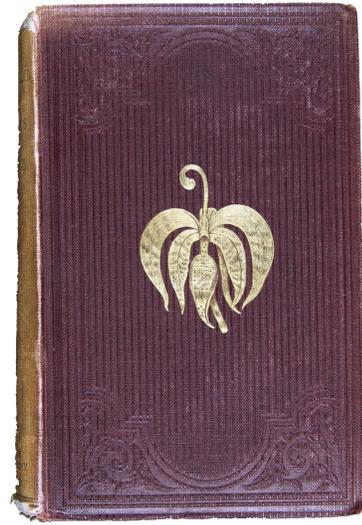
Darwin's theory of evolution was expressed most clearly in a foldout diagram which illustrates a pattern of "branching divergence," as species change by descent with modification from common ancestors. Darwin marshaled evidence from geology and geography showing that species appear, both geographically and in the fossil record, in patterns consistent with their descent by modification from common ancestors.

At the end of the *Origin*, Darwin closed with some meditative words: "There is grandeur in this view of life..." Curiously, the very last word of the book is the only place in the entire work where the word evolution appears in any form.



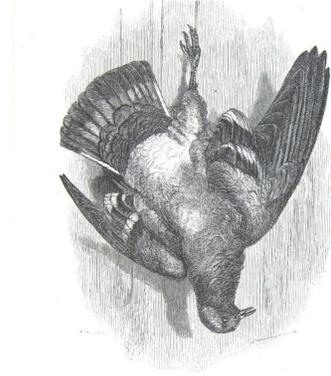
On the Various Contrivances by which British and Foreign Orchids are Fertilised by Insects, 1862; F800

Darwin spent the remainder of his life exploring the ramifications of his theory of evolution by descent with modification. Darwin's next work explored the immense degree of variation present in nature, using orchids as the prime example. A beautiful gilt inlaid depiction of an orchid adorns the cover.



The Variation of Animals and Plants Under Domestication, 1868; F878

In a two-volume work, Darwin investigated the degree of variation evident in domesticated animals. For example, the Rock pigeon was the parent form of all domesticated pigeons. It had given rise to the pouter pigeon, carrier pigeon, fantail pigeon, African owl pigeon and the short-faced tumbler pigeon. Domestic breeding illustrated Darwin's argument that the variation present in nature provides ample material upon which natural selection might work.



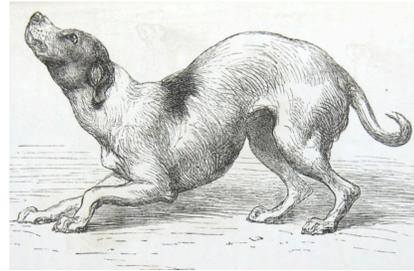
The Descent of Man and Selection in Relation to Sex, 1871; F937

In 1871 Darwin published a two-volume work which followed up on the brief aside in the *Origin* that his theory might throw light upon the origin of humans. In the *Descent of Man* he explored embryological resemblances between humans and other animals. Darwin offered sexual selection as an additional form of natural selection to account for pronounced differences between the male and female. Darwin admitted that the beautiful feather of the peacock gave him a headache. But with sexual selection, one might account for fancy tail feathers, after all, that seemed to be more for show than for function.



Expression of the Emotions, 1872

In 1872, to illustrate continuities between humans and animals, Darwin explored the expression of the emotions. Dogs have an amazing ability to convey emotions. Cats, also, can be affectionate or savage. Darwin described a chimpanzee as disappointed and sulky.



Darwin showed that the intricate muscles of the face enable humans and animals to express an astonishing variety of emotions. For example, the following *heliotype* (an early form of photography) from a psychiatric hospital in France showed how the expression of emotion could be imitated by applying electrodes to the facial muscles.

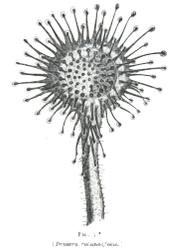


Botanist

Darwin regarded natural selection as a “universal law of nature.” Its comprehensive scope led him to investigate the natural world with a breadth of vision that encompassed both plants and animals. Darwin’s last several books were detailed botanical studies, as the immense variety and complexity of the plant world offered Darwin ideal opportunities to extend his theory of natural selection.

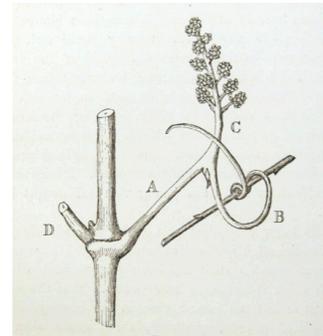
Insectivorous Plants, 1875; F1218

In a pioneering study of insectivorous plants, Darwin explored the adaptations by which plants are nourished in impoverished soils. He pointed out that the Sundew secretes a digestive fluid similar to an animal’s.



The Movements and Habits of Climbing Plants, 1875; F836

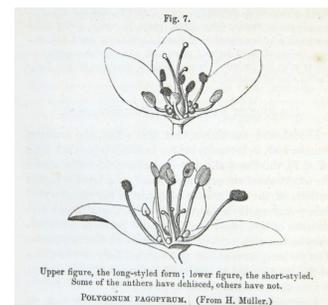
Darwin’s study of the movement of climbing plants, first published in the *Linnean Society* journal in 1865, appeared in book form in 1875. Darwin experimented with a variety of factors affecting plant growth and the movement of roots, vines and flowers. He demonstrated the importance of light sensitivity, which enabled a plant to move by elongating the stem on the side farthest from the light.



The Effects of Cross and Self-Fertilisation in the Vegetable Kingdom, 1876; F1249

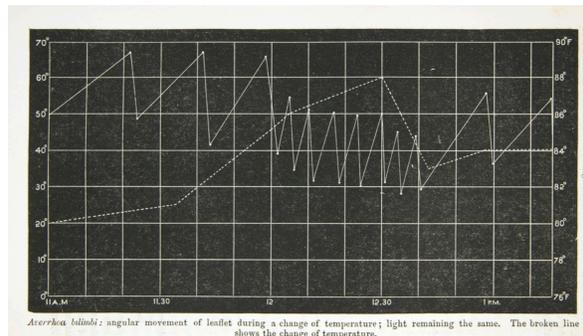
The Different Forms of Flowers on Plants of the Same Species, 1877; F1277

Darwin published two books on plant fertilization and the different forms of flowers that appear on the same species. These studies suggested that cross-fertilization produces more vigorous offspring than self-fertilization.

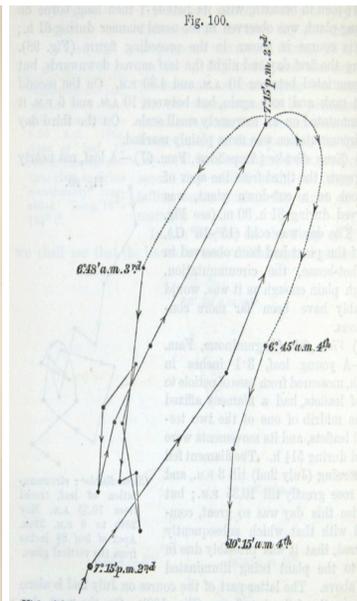
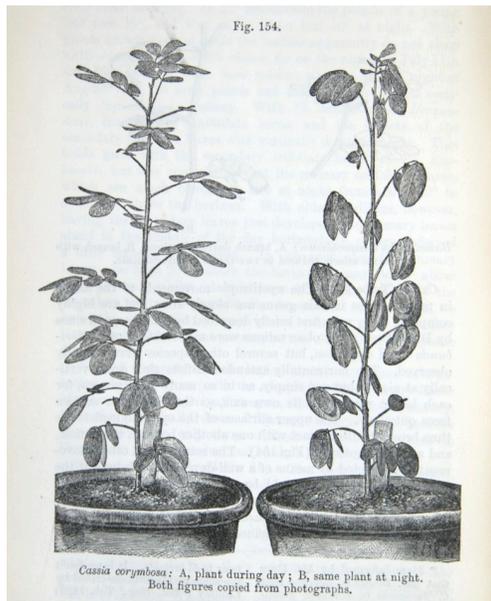


The Power of Movement in Plants, 1880; F1325

In 1880 Darwin continued his investigation of plant movements. As was his custom, he employed a wide variety of visual diagrams throughout the book. In the chart below, one line shows a change in temperature and the other shows the angular movement of a leaflet.



In the illustration below left, the *Cassia* plant extends its leaves during the day and folds them up at night. In the image below right, Darwin plotted the motion of a single leaflet — one of nearly a hundred such depictions in this work.



Formation of Vegetable Mould, Through the Action of Worms, 1881; F1357

The last work Darwin published is one of his least-known, but his study of mold and earthworms drew upon his broad interests. Darwin argued that earthworms turn over 18 tons of soil per acre per year, creating a suitable habitat for the growth of plants. Drawing upon some of his early geological work in the production of soils, it also represents a work of quantitative ecology. Like his other books, it also contains interesting visual representations — for example, a tower of earthworm casts and diagrams showing the importance of mold in forming soil.

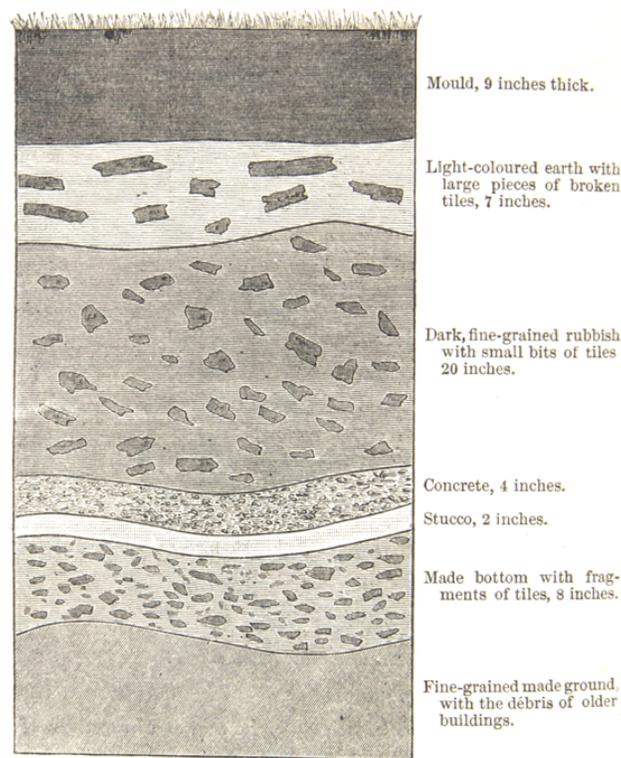
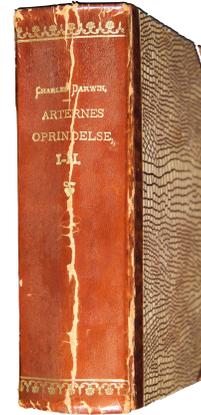


Fig. 12.

The OU Darwin Collection

More than First Editions

To view all of Darwin's printed volumes in their first editions yields an unforgettable impression of the breadth and beauty of Darwin's work. However, to support research, the Collections holds far more than just the first editions, for scholars need to see how editions of works were changed, and how translations differ. Darwinism in Germany was different than Darwinism in France or England or America, so hundreds of editions and translations have been collected. Two unusual examples are translations into Yiddish (*Descent of Man*, 1926; F1139) and Norwegian (*Origin of Species*, 1890); the latter (shown right) is not listed in the Freeman Bibliography.



More than Printed Works

Every Darwin first edition is available in high-resolution color images from the Collections' Online Galleries (bos.ou.edu/galleries/). In addition, OU is a major contributor to Cambridge University's *Darwin Online*. Having provided digital versions of nearly 40 obscure editions, the Collections' contribution is second only to Cambridge itself.

The Portrait collections include several depictions of Darwin, including a Darwin caricature from *Vanity Fair* magazine (Sept 30, 1871).



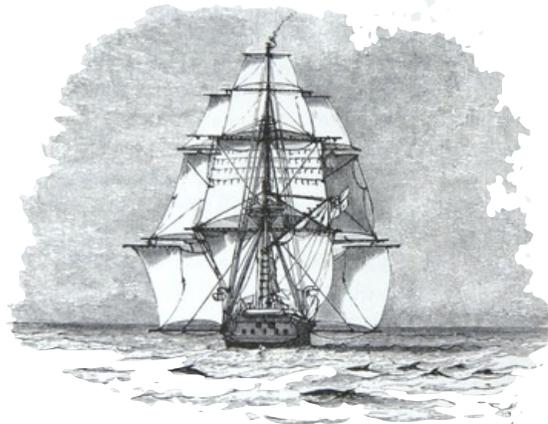
The History of Science Collections holds four of Darwin's manuscript letters. Many regard Darwin's handwriting as difficult to decipher — can you read it?



Also available in the History of Science Collections are the journals in which Darwin published his articles, the works of Darwin's contemporaries and recent books about Darwin that support current scholarship in the history of science.

With the resources of the Darwin Collection at your fingertips, the History of Science Collections of the University of Oklahoma Libraries offers an ideal place to read and study Charles Darwin.

Kerry V. Magruder, Curator



Feb 22^d 332
 1864 Beckenham Down.
Greenley.
Kent, S.E.

Dear Sir

I am much obliged to you
 for sending me a hybrid,
 gathered from a place
 to which I am so
 much attached as Maer.

You speak of a fruit of
 this hybrid, but say nothing
 more to me. If it be a
 red hybrid & not a
 strong variety, I do
 think, at least if

Dear Sir,
 I am much obliged to you for sending me a hybrid,
 gathered from a place to which I am so much attached as Maer....

Charles Darwin to Robert Garner, February 22, 1864



Charles Darwin, *Zoology of the Voyage of H.M.S. Beagle*, Part 2, Birds
(London: Smith, Elder, and Co., 1839-1843).

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